

No. 11965

IN THE

United States Court of Appeals

FOR THE NINTH CIRCUIT

LANE-WELLS COMPANY, a corporation,

Appellant,

vs.

M. O. JOHNSTON OIL FIELD SERVICE CORPO-
RATION,

Appellee.

M. O. JOHNSTON OIL FIELD SERVICE CORPO-
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vs.

LANE-WELLS COMPANY, a corporation,

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TRANSCRIPT OF RECORD

(In 3 Volumes)

VOLUME II

(Pages 225 to 478, Inclusive)

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for the Southern District of California,

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(Testimony of Frank E. O'Neill)

Q. Now, in the case of a formation packer, Mr. O'Neill, [239] the weight of the load is borne directly by the packer itself on the shoulder?

A. That is in the case of a cone type of formation packer. There is another type of formation packer.

Q. Go on, I didn't mean to interrupt you.

A. —which is known as a straight-wall packer. It is merely a rubber sleeve, rather thick sleeve with a mandrel through it and the mandrel telescopes into a tube above and the rubber sleeve is held between, you might say, between two plates and that type of packer requires an anchor or support from the packer to the bottom of the well, and that is set on the bottom and then the pipe is lowered down and the rubber is expanded between the telescoping members laterally to pack off against the bore of the well in formation.

That packer could be used in casing but it is more convenient to use the hook wall type of by-pass packer which we have shown here.

Q. Now, with the device lowered down into the well, Mr. O'Neill, as I understand it, at that time the trip valve is closed and the main valve is closed, and the by-pass or the equalizing valve is closed and the by-pass valve is open so that—

A. That is correct.

Q. So the tool is then in that condition lowered into [240] the well until the packer has reached the point at which it is desired to test—that is, you desire to test in the zone below the packer.

Now, does that packer divide the well bore into an upper and lower zone? A. It does, sir.

Q. All right. Now, if you have reached the point of test will you refer to the next figure, that is Figure 2

(Testimony of Frank E. O'Neill)

on Exhibit 14 for identification, and tell us what the position is of the valves at that time and their function in those conditions?

A. Now, in Figure 2 of the same chart the trip valve is shown closed as it was shown in Figure 1. The main valve or the trap valve shown opened by virtue of the pressure from above and the helico spring is shown collapsed from the weight above it. The helico spring which in its expanded position held the main valve on the set has been collapsed by weight from above and the mandrel attached to the main valve has pushed the valve downward off its seat. In the meantime the load has been supported by this casing packer slips—by the casing packer slips. The equalizing valve has also been telescoped together, contracted, and the ports are now separated by packing. It is closed.

The Court: Has that all been accomplished by a half turn to the left or right? [241]

The Witness: About a half turn or turn to the left, sir.

Q. By Mr. Mellin: And then lowering the weight?

A. Letting the pipe down from the surface.

The Court: All the operator does is make the turn at the surface?

The Witness: Yes, sir, from the surface the drill pipe or tubing is turned to the left and then by the brake on the rotary equipment he allows it to go down slowly. It is, of course, supported with block and tackle.

The Court: When the turn is made, as I understand it, these four slips are then ejected, so to speak, from either side and grip the walls of the casing and bring the lower part of the testing apparatus to a stop?

(Testimony of Frank E. O'Neill)

The Witness: That is correct, sir.

The Court: Then the weight of the upper portion of the tubing or drill pipe and the apparatus comes down to the spring, collapses the spring, and then that brings about the opening of the valve?

The Witness: That is correct, sir. The same downward weight also brings about the expansion of the resilient member that packs off the annulus between the body of the tube and interior wall of the casing.

The Court: That is part of the function of the packer?

The Witness: That is correct, sir. [242]

The Court: Or functioning of the packer?

The Witness: That is correct.

Q. By Mr. Mellin: At that time, Mr. O'Neill, in what condition is the trip valve? A. It is closed.

Q. What is the condition of the tubing or the tool above the strip valve? A. It is empty of fluid.

Q. And that would be at atmospheric pressure?

A. At atmospheric pressure, yes.

Q. And maintained at atmospheric pressure up to the point where you have now reached, the bottom has packed off—has closed off the by-pass valve, have packed off and have opened the main valve?

A. That is correct, sir.

Q. Then what occurs? Now, at that point, Mr. O'Neill, are you in a condition to take a test?

A. Yes, sir.

Q. And what is done then to take the test—that is, to admit the sample of fluid from the zone below the packer upwardly through the tool into the tubing?

A. An iron rod, spoken of in the field as a go-devil, is dropped down through the empty tubing. That rod

(Testimony of Frank E. O'Neill)

strikes a plunger which is a portion of the trip valve. It unlocks the trip valve and the trip valve is lifted off its seat, [243] partly by fluid pressure, and then partly by spring pressure because it opens upward. In that position the fluid which before had only passed the open main valve is allowed to go on into the tubing.

Now, that condition is permitted to exist until the operator is satisfied that he has sufficient test.

Q. And when the operator of the tool believes he has sufficient test then what does he do, if anything?

A. Then the driller at the surface picks up with his machinery on the tubing to which the tool is attached.

Q. Now, at that time, Mr. O'Neill, the whole tool and the tubing, at least a greater part of its weight, is suspended from the draw works, isn't it?

A. Yes, sir. In packing off you normally wouldn't pack off with more than, oh, five points on the weight indicator, which would be roughly five tons of weight.

Q. And what proportion—

A. Sometimes six or seven, but five or six would be average.

Q. And that is only a portion of the entire weight of the drilling string usually?

A. Oh, yes, the whole weight might be 20 or 30 or 40 points.

Q. 30 or 40 tons?

A. Depending on the depth. Each point represents a [244] ton—approximately a ton. It isn't exactly a ton because of the way in which the blocks are strung, so it is just considered in the field a ton. We will say a point is a ton when it isn't actually a ton, but it is approximately that.

(Testimony of Frank E. O'Neill)

Q. All right. Now, you have the tool with the by-pass valve closed, the packer set, the equalizing valve closed, the main valve open and the trip valve open and the fluid has passed upwardly in what direction?

A. The fluid has passed on through the anchor, up through the central bore of the packer, through the central bore of the equalizing valve, around the main valve, through the central bore of the main valve, the mandrel, through the bores in the trip valve, and on into the tubing and that fluid has raised in there by virtue of the differential pressure from the formation being tested and the atmosphere in the tubing. [245]

Q. Now, at that time does the hydrostatic head of the fluid above the packer have access to the interior of the tool?

A. No, sir. The hydrostatic head of the fluid above the packer is held up by the packer. That is the function of the packer, to pack that annulus off and prevent the hydrostatic head from having access to entry into the tool.

Q. Now, you desire to trap the sample. You have the sample in the tool. Then what do you do to entrap it and bring it to the surface?

A. The driller at the surface will pick up on his drill pipe or tubing, and as the tubing moves up, tension or pressure down on this helical spring is relieved, and between pulling up on the tubing and the action of the spring, the main valve is moved upward against its seat in a closed position. The trip valve remains open. It can't be closed until it is set manually at the surface again.

Q. What is the purpose, then, of the trip valve?

A. The trip valve is the valve of entry, because if in going into the hole we should through difficulties or

(Testimony of Frank E. O'Neill)

obstructions in the hole, or obstructions in the casing, hit the bottom of the packer, causing it to take weight, the main valve would open and fluid would immediately go into the tool. The trip valve has to be opened from a blow from above, so if the main valve opens and fluid goes in, it has no [246] effect, appreciable effect on the test, because this tube would probably hold, oh, I don't know, probably a pint of fluid or a quart of fluid is all.

The Court: That is the space between the main valve and the trip valve?

The Witness: That is correct, sir. And that would be of no consequence in a normal test.

Q. By Mr. Mellin: All right. Now, you have lifted the weight so you closed the main valve. Then what occurs?

A. Well, we continue this pull upward on the pipe, and depending on whether this equalizing valve is a locking or not locking—I won't go into locking, a locking type unless I am asked to—

Q. Just give its general function.

A. This equalizing valve will expand longitudinally and its ports will be aligned between the housing and the mandrel of the equalizing valve. During the test we have taken fluid out beneath the packer, and consequently holding the hydrostatic head up, we probably have a reduced pressure here, unless we run into a terrific flow, and even though it would be less, the hydrostatic head or the well would blow out.

Well, if I intend to pull on up and break the packer, or lift this—this is the actual hydrostatic head here and the low pressure below. When these ports are aligned, [247] then the fluid from the annulus passes down through the

(Testimony of Frank E. O'Neill)

port of the tool and through the packer and out through the perforated anchor, and is discharged beneath the packer, giving approximately, within a few feet of the hydrostatic head, the same pressure above the packer as below. In that position I can pull on up, open the by-pass valve by additional pull, and then very gently lift the packer off the seat, and start out of the hole with the tools.

Q. Now, at the time you open the equalizing valve, Mr. O'Neill, does the fluid that enters the equalizing valve from above the packer have access to the sample that has been entrapped above the main valve?

A. No, sir.

Q. Will the pressure of the hydrostatic head have any effect in opening the main valve at that time so that it can intermingle with the sample?

A. No, sir. The main valve is an upwardly seating valve, and when the hydrostatic head is released by the packer, it may be applied through the perforated anchor and upwardly against the valve, and merely tends to set the main valve tighter.

Q. All right. Now, what is done? You just pull out of the hole, do you?

A. Yes, the tool is extracted, withdrawn from the hole, and the drill pipe is normally run in what we call [248] stands, depending on the height of the derrick, but we roughly have 90 feet for the large derricks. They might not be exactly that, but at each of those stands it is unscrewed at the stand, and then they pick it up with the elevators and pull it to another stand, and set that back, and when they come to the fluid within the drill pipe, as they break the stand off they take a sample of the

(Testimony of Frank E. O'Neill)

fluid. They may take a sample on every stand, or they may only take a sample at the bottom of the tool.

Q. Why only at the bottom of the tool?

A. Well, if there isn't a lot of fluid taken in on the test, we know that from the packer down that we have mud fluid in the hole when we set the packer, and that amount of mud fluid is going to come in with the test. There is no way to get out of that.

Q. Is that a measured amount? Can you calculate that amount?

A. That amount could be calculated reasonably closely; substantially, you might say. Then when the area below or the zone below the packer has been cleared of the fluid, the formation fluid would come in behind it and we would expect to find the formation fluid the last fluid that entered the tool.

Now, that we would take out of the bottom sample. That is where under normal conditions of a shut-off test you might [249] get a production test, whereas if it came in under terrific pressure, and you left that mud, you might take whatever material flowed in.

Q. Then, as I understand it, the last sample just above the main valve is an important sample?

A. It is an important sample.

Q. Now, do you have with you, Mr. O'Neill, a model well and a model Johnston tester tool which will demonstrate the operation of the tool, and can you do that for us?

A. Yes, sir.

Q. Is that the tool, the model standing on the floor?

A. That is the model, yes, sir.

Mr. Mellin: May I have that marked, for identification, your Honor, Plaintiff's next in order?

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: Now, will you tell us, Mr. O'Neill, whether that—

The Court: Do you call that an operating model?

Mr. Mellin: It is an operating tool.

The Court: That is Exhibit 15, for identification, is it, Mr. Mellin?

Mr. Mellin: Yes.

(The model referred to was marked Plaintiff's Exhibit 15, for identification.)

Mr. Mellin: With the court's permission, may we move over here? [250]

The Court: Yes. And will you please all keep your voices up so that we can hear from here.

Mr. Mellin: And can we move the other tool so that your Honor can see?

The Court: Yes, if you will. What has just been marked Exhibit 15, for identification, is, as I understand it, an operating model of the Johnston tester now in use. Is that it?

Mr. Mellin: Yes, sir.

Q. By Mr. Mellin: You have in your hand the actual model of the Johnston tester. I notice that it has a cone type packer? A. Yes, sir.

Q. In making a test, Mr. O'Neill, is there any difference in function between a cone type packer and a casing packer, other than the cone type packer seats on a shoulder and divides the well bore into an upper and lower zone, and a casing packer seats in a casing and divides it into an upper and lower zone?

A. No. The function of the packer is to divide the well bore into an upper and lower zone, and we wedge packers depending on conditions we are running in.

(Testimony of Frank E. O'Neill)

Q. Will you briefly explain the operating model well and tell us how you simulated, as nearly as you could, the actual well conditions? [251]

A. I have here a vertical glass tube, glass for transparency. It contains mineral oil, which is supposed to represent the drilling fluid within the well at the time that the tools are run in. On the back of this panel I have a little hand pump, a pressure chamber, and at the base, this metallic base, in actuality there is a pressure chamber. In that metallic base I have water with red aniline dye in it to represent the fluid in the formations that we would get by testing. In view of the fact that I don't have natural formation pressure, I use the pump to put a little pressure on the tank below so that the fluid would rise in the tool and could be so seen.

Q. I notice that the well casing, or what simulates the well casing is not full of mud fluid. Will you explain why that is?

A. With mud fluid we wouldn't be able to see the tool at all.

Q. I mean, why don't you fill it completely with water?

A. Oh, because as we go into a well with a testing tool we constantly flush mud out at the surface, due to the displacement of the pipe, and I tried to leave this fluid low enough so that I would not flush it out on the floor.

Q. Now, would you proceed with the test, Mr. O'Neill, and tell us what is occurring as each step takes place. [252]

By the way, Mr. O'Neill, with respect to this model well and model tool, what do you use to simulate the weight of the drill pipe?

A. This level arrangement. It is impractical to have enough drill pipe above it, so I use that lever.

(Testimony of Frank E. O'Neill)

Q. Now, in this condition, Mr. O'Neill, according to your description the trip valve at the top is closed, the main valve is closed, the equalizing valve is closed, and the by-pass valve is open; is that correct?

A. Actually the equalizing valve is open, in this instance. It has been pulled open by the weight of the packer.

Q. Does that affect the operation of the tool?

A. It doesn't affect the operation of the tool in any way.

Q. All right. Now, as I understand it, it is being lowered into the well, as if it were in an actual well?

A. Yes, and down here there is a reduced bore, like a shoulder, and as the tool approaches, it is guided into that bore and the cone packer seats on the shoulder.

Q. And that simulates the seating of the packer, either of the cone type or formation packer?

A. That is correct.

Q. That divides the well bore into an upper and lower zone, does it not?

A. That is correct. The lower zone below the packer [253] and the upper zone above the packer in which the well fluid is trapped, so the hydrostatic head or drilling fluid is trapped above the packer.

Q. In that condition, resting on the shoulder, by the very fact of resting on the shoulder is the main valve open or closed, assuming there is no weight of drill pipe on it?

A. With no weight of the drill pipe on it, the main valve would be on its seat, but in a closed position. The main valve opens as hidden behind this metal collar here, or pretty nearly hidden behind it, but it has not been compressed. It is simply resting on the seat.

(Testimony of Frank E. O'Neill)

Q. Will you impose the weight, as you described, impose the weight of the drill pipe on the tool and tell us what occurs in the sequence that it occurs?

Mr. Foster: Before we go to that, I wonder if I may ask a question at this stage of the proceedings?

Mr. Mellin: Yes.

Mr. Foster: I understand, Mr. O'Neill, if you had an actual well the rat hole, that is, this cylinder down here—this cylinder down here of a reduced diameter, below the packer, simulates a rat hole?

The Witness: Yes, sir.

Mr. Foster: As a matter of fact, in an actual oil well wouldn't the drilling mud fill the rat hole?

The Witness: Yes, it would. [254]

Mr. Foster: So that to this extent you have the red liquid in the apparatus in the lower cylinder space simulating the rat hole and you are not imitating actual conditions in a well, filled with mud, are you?

The Witness: No. In the model it seemed to be impractical to get the drilling fluid all the way down and start to bring it up with the pressure.

Mr. Foster: Now, as I understand it, this colorless oil up in here, that simulates the drilling fluid?

The Witness: That is correct.

Mr. Foster: And if we were to simulate actual conditions in the well, that colorless liquid should fill entirely the rat hole, so that we should not have the three inches at all of the red liquid in the rat hole?

The Witness: That is right.

Q. By Mr. Mellin: In other words, then, Mr. O'Neill, in actual conditions there is a small intake of

(Testimony of Frank E. O'Neill)

mud in the rat hole or in the zone below the packer, which enters the tool prior to the formation fluid?

A. That is correct.

Q. Yes?

A. The fluid is in the bottom of the hole when we seat the packer, and it remains there until we open the tool.

Q. Now, I see your man is pumping back there.

A. He is pumping a little pressure on this tank to [255] cause the fluid to rise in the tool when the valves are opened.

Q. All right. Now, will you apply pressure to the top to simulate the imposition of weight on the tool, and tell us what happens, first.

A. As the pressure is brought down, the upper portion of the drill pipe is pulled down, the spring is compressed and the mandrel on the main valve passes through, causing the main valve to leave its seat.

Q. And open the main valve? A. Yes, sir.

Q. And what has happened to the equalizing valve?

A. The equalizing valve has been closed by other pressure downward. It is in a contracted position in the telescoping mandrel and housing.

Q. Now the tool is in condition to make a test?

A. The tool is now in condition to make a test.

Q. And what is done?

Mr. Foster: May I again interrupt, so that we don't have to duplicate this?

Mr. Mellin: Surely.

Mr. Foster: Do I have the court's permission?

The Court: Yes, but please keep your voices up.

Mr. Foster: Can you tell us the pressure that is exerted from the top of the tool now, when the main valve opened? [256]

(Testimony of Frank E. O'Neill)

The Witness: I don't frankly know just how many pounds he pulled down on the lever.

Mr. Foster: Can you tell us at this stage the pressure that is exerted upon the tank at the base of the device by the air pump?

The Witness: Yes, we have a gauge on it here, sir.

Mr. Foster: What was that pressure?

The Witness: It shows five pounds here.

Mr. Foster: That was a five-pound pressure when the main valve opened?

The Witness: Yes, sir.

Q. By Mr. Mellin: Approximately what would be the weight of the mineral oil above the packer, if you know, Mr. O'Neill? Would it be in excess of five pounds?

A. Well, I would say yes, possibly, but I am guessing.

Q. Now, what do you do to operate the tool? What is the rod that your assistant has?

A. The rod represents the go-devil, which is brought through the drill pipe to open the trip valve, the plunger of which can be seen through the transparent part of the housing of the tool. The rod will be dropped in, it will strike the plunger, and it should open that valve.

The Court: The operation of that lever at the top, with the handle on it, that is the turn to the left that you described of the tubing, which would permit the weight of [257] the string of pipe to compress the large spring, to open the main valve?

The Witness: Using this type of packer, sir, the cone type, it wasn't necessary to rotate to the left to arm the packer, because it does not have steel slips on it. I couldn't get steel slips to seat in the hard glass tube, so I had to use a cone packer.

(Testimony of Frank E. O'Neill)

The Court: The pressure you have applied to the model, Exhibit 15, for identification, simulates merely the weight of the drill pipe in wedging the packer into place; is that correct?

The Witness: That is correct.

Q. By Mr. Mellin: And sufficient to open the valve?

A. And sufficient to open the valve.

The Court: Well, the weight of the string of pipe itself compresses the large spring, does it?

The Witness: Yes, sir.

The Court: As the packer stops the movement of the string of pipe?

The Witness: That is correct, sir. That is correct. The weight of the pipe above it, which is telescoped, the mandrel of the valve and the spring is caught between the two parts of the valve, and it compresses the spring and pushes the valve off of its seat.

The Court: Is there a method of calculating that weight [258] in wells of extreme depth so that the packer can sustain it?

The Witness: Yes, sir. The wells today are practically all equipped with what is known as a weight indicator, and we know how many points on the indicator the string weighs before we seat the packer. Then when we seat the packer, we can let the weight down until we have six points on, or five points, or seven, or eight.

The Court: And the remainder is suspended weight?

The Witness: The remainder is still suspended from the derrick by means of a traveling box and cables.

Mr. Foster: May I ask a question, your Honor?

The Court: Yes.

(Testimony of Frank E. O'Neill)

Mr. Foster: I don't understand yet, Mr. O'Neill, why it isn't possible to have this level of rotary mud such that it completely fills the rat hole around the instrument before you open the valve with the dropping of the rod. It doesn't simulate the actual conditions. Why can't the red liquid be down in the tank here, at the bottom of the rat hole, as would be the case if we were, as I understand it, simulating actual conditions?

The Witness: I could probably pull it down. I have an idea we poured a little too much fluid in, Mr. Foster, but I could—

Mr. Mellin: We will stipulate, your Honor, that the hole below the packer, that is, the zone below the packer is [259] full of mud and will also stipulate that some of that mud goes into the tester ahead of the formation fluid. I don't think there is any point to it, though.

The Court: My question is, if you permitted all of that red fluid to go back into the tank at the base of the metal, by applying whatever pressure is needed, it would surely come out, wouldn't it?

The Witness: Yes, sir. And I could force all of the fluid out of this tank but I would then force it over the top of this pipe string. It is not possible for me to have enough pipe in here to represent the drill pipe in length.

The Court: Is it true that if you did what Mr. Foster suggested now, permit the clear oil to fill the space simulating the rat hole, and the remainder of the hole, would it mean only a difference in pressure to compensate for what is in the rat hole?

The Witness: It would merely mean that I would have to bring more fluid into my drill pipe, and that would

(Testimony of Frank E. O'Neill)

be just continued pressure, to raise it, and all of the clear oil below the packer would come into the drill pipe and then the fluid from the reservoir would come in.

The Court: If, as it stands now, it requires five pounds of pressure to pull the red liquid up into the tester, would a greater pressure be required to pull the red liquid up if the red liquid were all retreated into the tank at the [260] base?

The Witness: No, sir. It would be lifting the same hydrostatic head of fluid. It is just the difference in color.

Mr. Foster: I don't think pressure is involved, your Honor.

The Court: Both of them are of the same gravity, are they?

The Witness: The red fluid is water with an aniline dye in it, and the white fluid is a little lighter. It is mineral oil.

The Court: What is the reason, then, that the red fluid can't all be put in the tank at the base?

The Witness: I think it can. I think I can do it.

Mr. Foster: It was that way, your Honor, when the court started, but before they commenced the test, it seemed to me they deliberately changed it so that we have a distorted picture.

Mr. Mellin: The only difference will be that the red fluid will immediately start into the tester. The other way a little white fluid will come in first. What they are worrying about is that some mud comes in in actual use, and I will stipulate that it does.

The Court: I understand it does, but I would assume that the red fluid filling the rat hole, and having a head [261] start, would require less pressure for it to

(Testimony of Frank E. O'Neill)

enter the tester than it would if all of the red fluid were down in the tank and had to be forced up that additional—

The Witness: By the head of the white fluid that would be resting on it? In other words, if I took the volume of this red fluid, which is this small few inches that Mr. Foster referred to, and transmitted it into this tube, if it were white fluid, then the red fluid would have to lift the white fluid to get into the tube. Is that the question?

The Court: That is what I am asking.

The Witness: That is correct.

Mr. Foster: It is for that reason and because Mr. O'Neill has admitted this red liquid should not be here that I think the level should be adjusted so that the red liquid is all down in the base before we drop the rod to open the valve.

The Court: Can't you adjust the apparatus, then, to where the so-called red liquid, which is to simulate the formation fluid, the red liquid—

The Witness: Yes.

The Court: —so that you will have that all out of sight?

The Witness: I can try.

The Court: Very well. You mean you can do it today?

The Witness: I think so. I hope I can do it while I am here. [262]

* * * * *

The Court: You may proceed.

Mr. Foster: Might I have the court's indulgence of another question of Mr. O'Neill?

The Court: Have you removed the red fluid?

(Testimony of Frank E. O'Neill)

Mr. Foster: Yes, he has, your Honor.

The Court: You may proceed.

Mr. Foster: Mr. O'Neill, as I understand it, the uppermost liquid in this apparatus marked Plaintiff's Exhibit 15 for identification, is oil and the lower liquid is water, is that correct?

The Witness: The number for identification, does that include the entire well?

Mr. Foster: Well, the entire apparatus here, Exhibit 15.

The Witness: Yes, this clear fluid above is mineral oil and the fluid below in the tank, the red fluid, is water with aniline dye in it.

Mr. Foster: Then, as I understand it, we have the lighter liquid on top of the heavier liquid, is that true? We have a liquid on top of a lower specific gravity than the liquid on the bottom?

The Witness: That is correct.

Mr. Foster: Whereas in a well we would have rotary mud on top and the formation liquid on the bottom?

The Witness: That is correct. [264]

Mr. Foster: In an actual well, therefore, the conditions of this model would be reversed and we would have a liquid of a higher specific gravity on top and a liquid of a lower specific gravity on the bottom?

The Witness: Yes, sir.

Mr. Foster: And you say there is five pounds pressure now that has been placed or had been placed on the apparatus when the main valve was released?

The Witness: Well, five pounds on now.

Mr. Foster: And you earlier found that at the time of the release of the main valve? Is this five pounds

(Testimony of Frank E. O'Neill)

pressure on that gauge having due regard to the scale of the model? Is that typical of formation pressure in an actual well?

The Witness: No, I cannot say frankly that that is computed on a basis of formation pressure.

Mr. Foster: Now, isn't it true that there is a greater difference in the specific gravity—strike that if you will, please.

Isn't it true that the difference in the specific gravity of mud and oil is greater than the difference in the specific gravity of the oil and water you have in the model?

The Witness: Yes, the mud is heavier than the water.

Mr. Foster: Now, the difference in specific gravity between the mud and the oil that comes from the formation in a well, that difference is greater than the difference in the [265] specific gravity of the oil and water you have in this model, is that true?

The Witness: It probably is, sir. I think it probably is.

Mr. Foster: Then, your Honor, I move that testimony with respect to this model be stricken and that the court direct no demonstration of the model be had for these reasons:

A force has been exerted upon the upper end of the apparatus within the model by a hand lever which Mr. O'Neill cannot give us the value of, and hence, he cannot represent that it is in any way related to the weight of a drill pipe or simulates the condition in a well.

Second, he cannot say that the five pounds pressure which he is putting upon the apparatus is in any way related to the conditions found in an oil well.

Third, he has said that there is a 'greater—that the difference in the specific gravity of mud and the forma-

(Testimony of Frank E. O'Neill)

tion liquid which come in contact with an actual well is greater than the difference in the specific gravities of oil and water which he is using in this model; and, finally, and I think this is very important, he has said that in the model he has a heavier liquid on the bottom, the water, and a lighter liquid, the oil, on top. And he has said that that is just the reverse of the condition in an oil well where he [266] has a heavier liquid, the rotary mud on top, and the lighter liquid, the formation fluid, perhaps shot with gas, on the bottom.

I feel, therefore, that going further with this demonstration can afford no light upon the subject because all of these conditions are not only not typical of those found in an oil well but are the reverse of those found in an oil well.

The Court: Doesn't it all add up to this, Mr. Foster, that there isn't enough pressure on the formation liquid to force the formation liquid up into the tool, and all these factors you speak of deal with getting the formation liquid into the tester?

Mr. Foster: No, your Honor. I feel it goes farther than that. In an actual oil well we would have the rotary mud here on top and we would have a lighter liquid from the formation on the bottom.

The Court: What effect does that have?

Mr. Foster: The heavier liquid would tend to pass down through the lighter liquid.

The Court: It would tend to depress the lighter liquid but you have the rotary mud separated largely from the lighter liquid by your packers.

Mr. Foster: But when the packer is released, your Honor, or when the valve is released so that the light-

(Testimony of Frank E. O'Neill)

er [267] liquid from the formation can come in, the rotary mud from the formation also comes in. It comes in first and that rotary mud passes up through here and in a well it is heavier than the liquid which follows it, whereas here the conditions are reversed.

The Court: Well, all it does is in part, contaminate the test.

Mr. Foster: Yes, your Honor. I feel this is not proper for the reasons I have given.

The Court: We are not actually making a test. This model is designed not to take a test but to show how the apparatus functions.

Mr. Foster: Yes, but to the extent that it is attempting to show the operation of a device in a well in taking a sample it is wrong in all respects that I have indicated because they are reversed.

They have not only failed to simulate the conditions but they have reversed the conditions that are found in a well. Perhaps I haven't made myself clear. It is not that I am urging the apparatus will not take a sample. It is the fact that they have reversed the conditions in a well so that—

The Court: The conditions you speak of are conditions that either aid or deter the sample entering the tester, isn't that correct? [268]

Mr. Foster: Or contaminating it. Yes.

The Court: Isn't that correct?

Mr. Foster: They affect the goodness of the sample.

The Court: It is stipulated here that every sample is contaminated to the extent of drilling fluid or whatever may enter the tester or the fluid that is between the packer and the bottom of the well, isn't that correct?

(Testimony of Frank E. O'Neill)

Mr. Mellin: Yes, your Honor.

The Court: We have an admission of contamination and I suppose the amount of contamination depends upon the quantity X, the distance between the bottom of the packer and the bottom of the well. If the packer were high up in the well there would be greater contamination and I suppose that is compensated for in some instances by a larger sample.

Mr. Foster: Is that stipulated, Mr. Mellin?

Mr. Mellin: Stipulated this, as the court said, when the packer is set there is mud in the well and an unknown amount enters the tester. But Mr. Foster has stated a false premise. The weight of the mud fluid will have some effect on the sample after the sample has been taken. It doesn't make a particle of difference in this tool if that mud fluid is light or heavy because the moment that the tool is lifted and before the packer is unseated the valve, as the witness testified, the trap valve is closed so that the mud fluid cannot enter the tool, so whether the hydrostatic [269] head is greater or less doesn't make a particle of difference after the packer is released.

The Court: As I understand it, pressure has to do with forcing the sample up into the tester. Is that correct, Mr. O'Neill?

The Witness: Yes, sir. The differential pressure below the packer and inside the tube of the receiver.

Mr. Mellin: Which is empty when the test starts?

The Witness: Which is empty when the test starts and the fluid will go in there—there is sufficient differential pressure to cause it to move up. There is some friction through the tool.

(Testimony of Frank E. O'Neill)

The Court: I suppose, conceivably, the pressure in the formation might be so low that you couldn't coax the fluid into the tester?

The Witness: That might happen, sir.

The Court: The motion is denied.

Mr. Foster: So the record may be clear may it appear that none of the stipulations requested or suggested in our afternoon session have been accepted by the plaintiff?

Mr. Mellin: I made the stipulation earlier, Mr. Foster.

Mr. Foster: You made an admission. Let us put it that way.

The Court: Let us be clear, gentlemen. What stipulation do you propose? [270]

Mr. Foster: Well, the stipulation I asked for was a stipulation that should have been worded as an admission from Mr. Mellin, that the statements made by your Honor were correct; that is, that the greater the distance from the packer to the bottom of the hole the greater the quantity of mud that would enter the tester when the tester was open.

The Court: Let us ask Mr. O'Neil about that. Is that true, Mr. O'Neill? I made a statement that I assumed the greater the distance between the bottom of the packer and the bottom of the hole the greater the quantity of the drilling fluid or mud that would enter the testing apparatus?

The Witness: Well, actually, sir, the distance, the greater the distance between the bottom of the packer and the lowest inlet port to the tool, the mud fluid that is down below that point, provided it is not opposite a formation that would drive it, would probably be quiescent.

(Testimony of Frank E. O'Neill)

The Court: And permit the lighter fluid to rise through it?

The Witness: No, no, not that, sir. In other words, many times we will be taking a test at a considerable distance off of the bottom and perhaps there will be perforations up here and way down in here there are no perforations, but it is still full of mud. Now, when we let the tool in the lowest inlet port to the tool might be down two or three feet below the perforations in the pipe, but a long ways from [271] the bottom of the hole and there is no opening in the pipe at the bottom of the hole in such case as to cause this very bottom fluid to come up, so the bottom fluid will lie quiescent and the fluid from the formation can go through the perforations.

The Court: From the side?

The Witness: From the side would enter the lowest ports, entrance ports into the tester, and then go up and that would really govern the fluid taken in below the packer unless, as I say, we are testing where the whole formation is open and then from the bottom of the hole. Have I made it clear, sir?

The Court: It is clear to me. Does that cover the matter, Mr. Foster?

Mr. Foster: Well, it doesn't answer these points that I have raised, your Honor.

The Court: I mean so far as the subject under discussion is concerned it is clear the way in which I stated it?

Mr. Foster: Yes, except under the last condition that Mr. O'Neill named, where he said if the packer were set, as I understood him, near the bottom of the hole in an open hole formation, for example, then it is true that all

(Testimony of Frank E. O'Neill)

of the mud below the packer to the bottom of the hole would enter.

The Witness: Would be expected to, yes, sir.

Mr. Foster: And therefore the greater the depth of that [272] hole under those circumstances the more of the mud that would enter the tester.

The Court: Except where you are taking a test out of the rat hole at the bottom of the hole the statement of the court would be correct?

The Witness: Yes, sir.

The Court: But where you are taking the fluid from the perforations in the side of the casing the situation would be as you have described it?

The Witness: Yes, sir.

The Court: You may proceed.

Mr. Mellin: Now, as I understand it, the tool is now in the position which you would assume awaiting a test? That is, the trip valve up above is closed?

A. Right here.

Q. By Mr. Mellin: The trip valve is closed maintaining atmospheric pressure in the tubing above the trip valve? A. That is correct.

Q. The trap valve or main valve is open to admit a sample? A. Hasn't been opened yet.

Q. Will you put the pressure on it and the lever pressure simultaneously to open the main valve and collapse the spring so a sample can enter? A. Yes. [273]

Q. Now, the purpose of the main valve ultimately is to trap the sample above the main valve and the by-pass valve, equalizing valve is closed and the by-pass valve is closed?

A. There is no by-pass in this packer.

(Testimony of Frank E. O'Neill)

Q. But the equalizing valve is closed?

A. Correct.

Q. So the tool is now in condition for a test awaiting the opening of the trip valve?

The Court: All that remains to be done now, as I understand it, is to drop this go-devil so as to open the trip valve?

Mr. Mellin: That is correct.

The Witness: That is correct.

Q. By Mr. Mellin: Now, will you drop the go-devil?

A. As it strikes this plunger it should release the trip valve. It has such a short distance to drop it didn't quite release it.

Mr. Foster: Does that often happen in actual practice?

The Witness: No. We have so much further to drop it that it rarely happens. Now it is open and you can see the fluid coming up. There is the white fluid below the packer, entering it, and the red fluid from the formation behind it and it can be seen again when it approaches here, and the red fluid from the formation is passing on through the main valve, through the trip valve and apparently— [274]

The Court: The rest of it is simply a matter of pressure?

The Witness: That is correct, sir.

Q. By Mr. Mellin: Now, that the tool is in the condition to allow the sample to enter in above the main valve does the hydrostatic head exert any pressure on it?

Mr. Foster: May I interrupt for just a moment? I notice here we have zones of white liquid intermediate of the tool and above and zones of red liquid above.

(Testimony of Frank E. O'Neill)

The Witness: There is some white liquid in there; apparently there is something that isn't sealed completely and some of the hydrostatic head may have entered.

Mr. Foster: In other words, we have a zone of the lighter liquid in the tool below a zone of the red heavier liquid as the apparatus now stands and then a zone of white liquid above the zone of red liquid again, is that correct?

The Witness: The zone of white liquid above the red liquid came in below here.

Q. By Mr. Mellin: Below the packer?

A. That is the first fluid that entered. That is the mud below the packer. The red liquid came on through. There appears to be some white liquid here which would indicate a leak in the device.

Mr. Foster: The word "here" does not show in the record. Isn't it true, Mr. O'Neill, that as the apparatus now stands, [275] at the bottom of the tool we have a zone of white liquid and we have a zone of white liquid up here at about the middle of the tool, and then three-quarters of the way up we have a zone of red liquid, and then at the top of the tool, inside the tool, we have a zone of white liquid. Isn't that true?

The Witness: As the apparatus now stands, there is.

Mr. Foster: Can't you answer the question yes or no? Isn't that true?

The Witness: Will you repeat the question?

Mr. Foster: Will you read the question, please?

(Question read.)

The Witness: Yes, that appears to be the case.

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: What would occasion that, Mr. O'Neill?

A. There is either a leak on the packer seat or a leak in the tool, I don't know which it is.

Q. And in the making of an actual test would you call this a successful or unsuccessful test?

A. That would be an unsuccessful test, sir.

Q. In actual practice it would have to be run over, would it?

A. It would be required to be run over in all probability.

Q. Now, as I understand it, at this point the valves, [276] the trip valve is open, the main valve is open, still open, and the equalizing valve is closed, is that correct? A. That is correct, sir.

Q. What is the first thing that occurs now when you start to remove that tool from the well?

A. The pressure, the force downward would be relieved from the top of the drill pipe.

Q. Just a minute—all right, go ahead.

A. The drill pipe will be picked up; in this case merely we will raise this lever and take the pressure off and raise up on the pipe enough to let the spring expand here, the main valve helical spring and this main valve move upward and seat against the seat of the main or trap valve.

Q. And what does that do?

A. That traps within the tool above the main valve, the fluid which has passed upwardly past the main valve and on into the tubing.

Q. And does that main valve close before the packer is unseated? A. Yes, sir.

(Testimony of Frank E. O'Neill)

Q. And thereafter when the packer is unseated what effect, if any, would the hydrostatic head have on the main valve?

A. Merely tend to press it tighter against its seat.

Q. And what condition is the trip valve in now? [277]

A. The trip valve is open.

Q. And it remains open from here in, does it, until the tool is removed from the well?

A. Until the tool is removed from the well and reset manually.

Q. And at the present state with the packer still seated, the equalizing valve is still closed, is it not?

A. That is correct, sir.

Q. Now, what is the next operation?

A. The next operation would be to raise up slowly on the pipe and the equalizing valve, you see here, has expanded and the fluid from the hydrostatic head passes through this in below the equalizing valve.

Q. And downward?

A. Downwardly and into the rat hole chamber to equalize the pressure above and below the packer.

Q. All right. Now, as you continue to pull out what is the next, after the equalizing valve is open and the pressure above and below the packer is equalized, what is the next step?

A. To lift the packer off the seat by an upward movement of the drill pipe.

Q. And now where is the sample that was taken?

A. The sample is trapped in the pipe above the main valve. [278]

(Testimony of Frank E. O'Neill)

Q. All right, that is fine. What are you going to do with the tool now?

A. Just leave it set in the model for the moment until we have to use it again.

Q. Bail it out or something?

A. Yes, if we have to run it again.

Q. Will you take the stand again, please?

Mr. Foster: At this point, your Honor, we move to strike the testimony with regard to this test because it is admittedly an unsuccessful one.

The Court: Motion denied.

Mr. Mellin: At this time, your Honor, I would like to offer in evidence the enlarged chart of the Johnston tester offered for identification as Plaintiff's Exhibit 14, as 14 in evidence.

The Court: That is the chart on the easel?

Mr. Mellin: Yes, your Honor.

The Court: Which has the four figures on it?

Mr. Mellin: Yes.

The Court: The four drawings?

Mr. Mellin: Yes.

Mr. Foster: Are they drawn to scale, Mr. Mellin?

Mr. Mellin: I think so. I think some of the valves are not precisely drawn to scale but diagrammatically illustrate the witness' testimony. [279]

Mr. Foster: Then I object to it since it is not precisely accurate, on the ground it is irrelevant and immaterial. Do you intend to offer the drawings which you gave us a copy of with your interrogatories as illustrating the plaintiff's tool?

Mr. Mellin: Oh, yes.

(Testimony of Frank E. O'Neill)

The Court: Is this Exhibit 14 a duplicate of the drawing?

Mr. Mellin: Except for minor details of construction of some of the different parts. For example, the minor details of two valves are not illustrated. As the witness said, it was merely diagrammatical of it to illustrate his testimony and show the opening and closing of the valves.

Mr. Foster: This is the drawing that was given to us with the interrogatories and on which our selection of claims to be relied upon as infringed are based.

Since the drawing is diagrammatic and wholly unlike this one, we object to it as inaccurate and immaterial and irrelevant.

The Court: Well, you have heard the witness' testimony. Did he testify in connection with this diagram to anything that surprised you with respect to the operation of the tester?

Mr. Foster: I think not, your Honor.

The Court: The diagram is only for the purpose of [280] illustrating Mr. O'Neill's testimony, so the objection will be overruled and Exhibit 14 for identification is received in evidence.

(The chart referred to was marked as Plaintiff's Exhibit 14 and was received in evidence.)

Mr. Foster: Do you have a copy of that?

Mr. Mellin: That is the only one I have, Mr. Foster. The model of the Johnston tester referred to by the witness and marked for identification as Plaintiff's Exhibit 13, is offered in evidence as Plaintiff's Exhibit 13.

Mr. Foster: That is objected to on the ground, your Honor, that it has not performed a successful test.

(Testimony of Frank E. O'Neill)

Mr. Mellin: I beg your pardon. That is the small tester.

The Court: It is offered as an illustrative model of the tester now in use.

Mr. Mellin: That is correct, your Honor.

Mr. Foster: Is that offered also as illustrative of the testimony of the witness?

Mr. Mellin: I offered it in evidence, Mr. Foster.

The Court: The objection is overruled. Exhibit 13 for identification is received in evidence.

(The model referred to was marked as Plaintiff's Exhibit 13, and was received in evidence.)

Q. By Mr. Mellin: Now, Mr. O'Neill, in connection [281] with Exhibit 14 you did not describe which I see is marked on the chart as the pressure recorder. Will you briefly tell us what that has to do, if anything?

A. The pressure recorder is a clock driven recording gauge. At the time the tools are assembled to be run into the well the pressure recorder clock, which is wound up, is tripped and allowed to start to run. It rotates a chart and the pressure mechanism draws the pressures graphically on that chart from the time that the tool leaves the surface to the bottom of the well throughout the test, and until the tool is pulled back to the surface and the clock mechanism stopped manually.

The clock will operate, oh, I think up to about 72 hours.

Q. And does the addition of that pressure recorder at the bottom of the Johnston tester in any way modify or change the operation of the Johnston tester?

A. The addition of the pressure recorder to the bottom of the device has the effect of letting the operator know from the chart, whether or not the valves in the

(Testimony of Frank E. O'Neill)

tool have opened properly or whether the tool plugged during the test.

It has no effect on the operation of the device itself.

Q. Are you familiar with—by the way, may I strike that? To illustrate the witness' testimony I would like to [282] offer in evidence the operating model of the Johnston tester which has been marked 15 for identification.

Mr. Foster: That is objected to on the ground that it is a model that performed the unsuccessful test and it is immaterial and irrelevant.

The Court: Objection overruled, and Exhibit 15 for identification is received in evidence.

(The model referred to was marked as Plaintiff's Exhibit 15, and was received in evidence.)

Q. By Mr. Mellin: Mr. O'Neill, are you familiar with the construction and operation of the Johnston perforation gun? A. Yes, sir.

Q. And that is the gun which the plaintiff is utilizing today in its perforating operations? A. Yes, sir.

Q. Do you have with you an enlarged drawing of that showing the correct—accurately disclosing the construction of that gun and the parts thereof?

A. Yes, sir.

Q. Is that the drawing which is on the easel before you? A. Yes, sir.

Mr. Mellin: May I have that marked for identification, your Honor, as Plaintiff's Exhibit 16? [283]

The Court: The drawing or chart containing two illustrations of the perforation gun?

The Witness: Yes, sir.

(Testimony of Frank E. O'Neill)

The Court: Now in use by the Johnston Company?

The Witness: That is correct, sir.

Mr. Mellin: Is that 16, Mr. Clerk?

The Clerk: Yes, 16 for identification.

(The drawing referred to was marked as Plaintiff's Exhibit 16, for identification.)

Q. By Mr. Mellin: Now, I hand you what appears to be a model and is labeled "Johnston Perforator Gun." It has no operating parts and I will ask you if that is a simulation to scale of the external appearance of the Johnston gun?

A. The external appearance, yes, sir.

Q. Is that in a scale in proportion to the model, Plaintiff's Exhibit 13, the other model that you produced of the tester?

A. Yes, sir.

Q. Now, from the chart, Mr. O'Neill, Plaintiff's Exhibit 16 for identification, would you please approach it and explain to us, please, its construction and its mode of operation?

The Court: Do you desire this small scale model which the witness just identified marked for identification?

Mr. Mellin: Yes, I should like to have that marked for [284] identification as Exhibit 17.

Mr. Foster: We already have an Exhibit 17.

The Court: 17 is the book of patents.

Mr. Mellin: Yes.

The Clerk: This will be Plaintiff's Exhibit 18 for identification.

(The model referred to was marked as Plaintiff's Exhibit 18, for identification.)

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: Now, from that drawing will you please proceed, Mr. O'Neill, and describe to us the construction and operation of the Johnston tester gun as used today by the plaintiff.

A. The gun is composed of a solid mandrel with a coupling on the top end of it and a connection is shown here by which this solid mandrel is connected to the bottom of the testing device. It has a solid mandrel and then the cage body with the bowed springs for frictional purposes.

It has a firing mechanism which involves the latch retaining rods, shown here at this point and so marked; the latch levers and a plunger which is a firing plunger. Below that the body of the gun which contains the barrels of the gun with the bullets; the powder charge for expelling the bullets from the gun and a central duct along the longitudinal axis of the gun, which central duct passes through the powder charge within the upper part of the gun or the gun [285] body, or just above the gun body is a coupling unit or coupling nut which carries within it a chamber in which .32 caliber blank cartridges can be placed with their detonating cap upwards.

Q. How many of those .32 caliber cartridges are there there?

A. They are run at times with two and at times with four. On the solid mandrel of which I spoke, there is a buttressed thread and in the cage body there is a tapered recess which carries within it and connected to it, a split nut with matching buttressed threads on the mandrel.

(Testimony of Frank E. O'Neill)

Q. Is the mandrel the member by which the gun is suspended in the well?

A. The mandrel is the member by which the gun is suspended. In the firing head the latch levers have rollers at each end and at the center.

The center roller is a locking roller which fits into a groove, a curved groove known as a locking groove in the firing piston and when the rollers are engaged in the locking groove they are held in engagement with the piston.

Q. Is that the plunger marked "Plunger?"

A. The plunger, I am sorry, sir. It is marked "Plunger" and held in engagement with the plunger by the latch retaining rods. The plunger is not able to move downwardly or upwardly. [286]

Q. In other words, it is like a trigger that is locked in position, is that correct?

A. That is correct, sir. The bottom end of the plunger extends into this cartridge chamber in which there is atmospheric pressure, sealed in. The top end of the plunger extends into the chamber above which is open to the hydrostatic pressure within the well.

Q. So that the hydrostatic head is constantly exerting a force on that plunger to drive it down to fire the cartridge?

A. That is correct, sir.

Q. And it is latched from doing that by those latch levers that you referred to?

A. That is correct, sir.

Q. Proceed.

A. When the gun has been suspended on the bottom of the tool and has been lowered into the well to the point at which it is desired to fire the gun, the drill pipe or

(Testimony of Frank E. O'Neill)

tubing at the surface is rotated to the right. It requires 12 turns of rotations on the drill pipe to finally free the firing mechanism or the plunger.

As the drill pipe is rotated to the right weight is lowered down onto the solid mandrel and the solid mandrel screws downwardly on its buttressed threads through the split nut. [287]

The reason for the split nut actually being split is that if in going into the well inadvertently the device is turned when we pick it up to take the slips out of the rotary table at the surface so the pipe can be lowered further, the mandrel is pulled back through the split nut and we still have 12 turns to make before the gun can be fired. That is a safety measure.

Q. In other words, that is to compensate for any inadvertent turning of the drill stem as it is lowered?

A. That is correct, sir.

Q. When the 12 turns with the attendant lowering of the mandrel have been made the threads on the mandrel have passed through and below engagement with the threads on the nut?

A. At that time the friction springs which have prevented the cage body from rotation and which will permit the mandrel to lower after the threads have been disengaged but will hold the cage body stationary, the lower member.

Q. Is it marked there "Latch Retaining Rods?"

A. Firing head assembly. It drops with reference to the latching retaining rods until this group of latch levers with the firing head assembly have passed downward a distance that puts the top rollers on the latch levers below contact with the latch retaining rods. At that time the

(Testimony of Frank E. O'Neill)

levers are allowed to spring apart as shown in Figure 2. The rollers [288] which were in the locking groove are forced out of the groove by the hydrostatic pressure. The plunger is driven downwardly into the low pressure chamber and the cartridge chamber has been so placed that the cartridges lie immediately below the descending plunger. The plunger strikes the cartridges and fires the blank cartridges. The flash from the cartridges passes downward through the central duct and the duct passing through the powder chamber, which explodes the powder, driving the bullets laterally or horizontally against the casing to perforate the casing.

Q. In other words, then, the gun is suspended, as I understand it, the gun is suspended in the tubing at the point where you desire to shoot or perforate and then the mandrel, the solid mandrel through the medium of the tube is turned 12 turns to the right, which releases the plunger so that the hydrostatic head can drive it against the firing cartridges to explode the powder chambers behind the perforating bullets. Is that correct?

A. That is correct, sir.

Q. You may take the stand again.

Mr. Mellin: May I offer this chart in evidence, your Honor, as Plaintiff's Exhibit 16?

The Court: Plaintiff's Exhibit 16 for identification is received in evidence. [289]

(The chart marked Plaintiff's Exhibit No. 16, was received in evidence.)

The Court: That is the chart concerning which the witness just testified?

Mr. Mellin: Yes, your Honor.

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: Are you familiar with the construction and operation of the Johnston Tester and the Johnston Perforator Gun when they are assembled together for operation, Mr. O'Neill? A. Yes.

Q. This chart which is before you, do you recognize it?

A. Yes, sir.

Q. Was that prepared under your direction?

A. It was, sir.

Q. And does that accurately, although diagrammatically, illustrate the Johnston Tester with the Johnston Gun suspended below it for operation?

A. Diagrammatically, sir.

Q. And would you please—

Mr. Mellin: May I have that marked, your Honor, for identification, Plaintiff's next in order?

The Clerk: Plaintiff's Exhibit 19 for identification.

(The chart referred to was marked as Plaintiff's Exhibit 19, for identification.) [290]

The Court: This chart is in effect, I take it, a combination of this chart and Exhibit 14 in evidence, the tester plus the chart in evidence which is Exhibit 16 of the perforator gun?

Mr. Mellin: Practically so, your Honor. I think there is one additional view on here which became necessary to further explain the operation.

Q. By Mr. Mellin: Now, briefly, Mr. O'Neill, will you approach the chart and briefly give us the sequence of operation of the two tools when they are joined together with Exhibit 18, which is the Johnston Gun, and Exhibit 13, a model of the Johnston Gun—a model of the Johnston Tester. Will you tell us how they are put together?

(Testimony of Frank E. O'Neill)

The Court: You are referring now to Exhibit 18 for identification?

Mr. Mellin: Yes.

The Court: Being a small scale model of the Johnston Gun.

Mr. Mellin: Yes. Using those two would you tell us how they are assembled together as illustrated on Exhibit 19 for identification?

A. The gun is screwed to the bottom of the pressure recorder mechanism. The pressure recorder mechanism is shown and so marked on this chart. It is manufactured with a screw plug on the bottom so that two recorders may be run [291] together if we care to, and to put the two recorders together we merely remove the plug at the bottom and screw another recorder on and when we are running one recorder the plug is left there just to protect the threads. So, to connect the gun to the bottom of the recorder it is merely necessary to remove the plug from the bottom of the recorder and have a suitable connecting piece or collar or coupling that will screw to the gun and to the bottom of the recorder to attach the two together. It is merely screwed on the bottom of the device.

The Court: Which you are illustrating now by screwing Exhibit 18 for identification onto Exhibit 13?

Mr. Mellin: That is right, your Honor.

Q. By Mr. Mellin: Now, in that condition, when you have screwed the gun onto the bottom end of the tester. Mr. O'Neill, as you have just done in connection with Exhibit 13 and Exhibit 18, is the gun then ready to operate as a gun and the tester then ready to operate as a tester?

A. Yes, sir.

(Testimony of Frank E. O'Neill)

Q. Now, is that the condition which is illustrated in the chart, Exhibit 19 for identification?

A. Yes, sir.

Q. Now, just briefly will you describe to us how a perforation is effected and testing effected by reference to Chart 19, of the Johnston Tester with a Johnston perforator [292] gun assembled on the lower end thereof?

A. Well, Figure 1 of this chart 19 for identification, shows the tester and the valves as described in Figure 1 of the previous chart, Exhibit 14.

The Court: Figure 1 of Exhibit 14?

The Witness: Yes, sir. But it also shows the perforating gun attached to the bottom of a formation tester.

Q. By Mr. Mellin: With the gun in condition shown as in Figure 1 of Exhibit 16?

A. With the gun in the condition shown in Figure 1 of Exhibit 16, yes, sir.

And in that condition the combined device would be lowered into the well until a point is reached at which it is desired to fire the gun and at that time the supporting tubing at the surface would be rotated to the right 12 turns, lowered slowly as it is rotated. It is lowered merely to keep the split nut from jamming as it goes in—just keep lowering it a little bit, three or four inches, during the 12 turns.

Q. And during that turning what effect, if any, does that rotation of the drill stem to condition the gun for firing, have on the tester, if any?

A. None, sir.

Q. All right, proceed please.

A. The rotation is continued until the 12 turns have [293] been accomplished as described on the chart for identification 16, and the gun fires.

(Testimony of Frank E. O'Neill)

Q. Just a moment. At that time the gun is fired and the testing tool remains, the parts of the testing tool remain exactly as they are shown in Figure 1 of the chart, do they? A. That is correct, sir.

Q. And that is in exact accordance with the condition of the parts of the tester in Figure 1 of that chart in evidence as Exhibit 14? A. That is correct, sir.

Q. All right. Now, the gun is fired. Does that have any effect on any of the operating parts of the tester, the firing of the gun? A. None whatsoever.

Q. Does it condition the tester in any fashion for taking a test? A. Not at all, sir.

Q. Then what do you do at that time if you desire to take a test at that time?

A. If we desire to take a test at that time common practice would be to raise the gun or the tubing some six or eight or ten feet just to get the gun away from being opposite to the shot holes for fear of a rush of sand. It might sand it up. It isn't necessary but it is a safety [294] precaution. And at that time the drill pipe at the surface is rotated one turn to the left to unlatch the casing packer as previously described for the casing packer, and the weight is lowered down to set the casing packer, to pack off the annulus between the packer and the walls of the casing, to support the hydrostatic head.

Q. And is that exactly—and then from there in, in making the test, is the operation of the tester identical as you have described it when it is run without a gun and in connection with Exhibit 14 in evidence?

A. It is identical, sir.

(Testimony of Frank E. O'Neill)

Q. And during the time that the tester is operating is there any operation of the gun?

A. No, the gun finishes its work when it has been fired. Its work is finished.

Q. Now, does the operation of the tester in any way perform any operation with respect to the gun or modify its operation?

A. None at all. [295]

Q. Now, what do these figures on this chart illustrate, Exhibit 19, for identification? Just tell us the condition of the gun and the tester in each of the five figures.

A. Well, the condition of the tester in Figure 1 is the trip valve is closed, and the main valve is closed, the by-pass valve is open, and the packer has not been seated, and the gun is in a safety position. The plunger is held by the locking or the latched levers.

In Figure 2 we are in exactly the same position in the formation tester part, but the gun has been fired by rotating the 12 turns to the right, so the large levers have released the plunger and the plunger is down upon the cartridges in the cartridge chamber.

In Figure 3 the trip valve in the testing tube is still closed, the packer has been set and the main valve has been opened after the equalizing valve was closed. So the gun is in no different position from what it was in Figure 2, but the testing device is in a position now where a test could be started by dropping a go-devil down into the drill pipe to release the trip valve.

In Figure 4 the trip valve has been opened by dropping the go-devil. The main valve is still open, as it was in Figure 3. The equalizing valve is still closed as in Figure 3, and the by-pass valve is closed, as in Figure 3. The gun is in identically the same position it has been

(Testimony of Frank E. O'Neill)

since [296] it was fired in Figure 2, and in Figure 3 it remains the same.

Then in Figure 5 the trip valve remains open, the main valve has been closed by lifting up the weight of the tubing off of the helical spring and pushing up on the main valve. The equalizing valve has been opened by further upward movement of the drill pipe above. The by-pass valve on the packer has been opened. The packer has been pulled free of the pipe. The sample is trapped in above the main valve, and the gun is still in the position that it was in after being fired in Figure 2.

Q. Did the gun perform any operation whatsoever after it was fired? A. None whatsoever.

Q. Then did the tester perform any operation other than as a part of the drill stem, as apart from the firing of the gun? A. That is all.

Q. And as an intermediate connection between the gun and the tubing? A. That is correct, sir.

Q. Now, will you state whether or not the tester operates in exactly the same fashion in the well to perform a test with the gun attached, as it does without the gun attached? [297] A. Precisely the same.

Q. Will you state whether or not the gun performs precisely the same operation, whether it is run in with the tester or run in without the tester?

A. Precisely the same thing; the same operation.

Mr. Mellin: May I offer that diagram in evidence, your Honor, as Plaintiff's Exhibit 19?

The Court: Exhibit 19, for identification, is received in evidence.

(The diagram referred to was marked Plaintiff's Exhibit 19, and was received in evidence.)

(Testimony of Frank E. O'Neill)

Mr. Mellin: You may take the stand again, Mr. O'Neill.

The Court: Do you desire to offer 18, for identification, the small-scale model, into evidence?

Mr. Mellin: Yes, your Honor, I would like to offer that in evidence as Exhibit 18.

The Court: Exhibit 18, for identification, is received in evidence.

(The model referred to was marked Plaintiff's Exhibit 18, and was received in evidence.)

Mr. Foster: That it is not offered as representing all of the interior mechanism.

Mr. Mellin: No, just offered to show the outline, the exterior of it on the same scale proportion as the large sized one is to the full-sized tester. It bears the same [298] proportion to the model of the well tester.

Mr. Foster: Very well.

Q. By Mr. Mellin: Now, Mr. O'Neill, when a tester is employed and the packer is set and you desire to take a test in the zone below the packer, will you explain to us, please, what formation fluid, if any, enters the tools—the tubing through the tools for recovery with the sample?

A. When the tester is run into the well, the well is full of fluid, drilling fluid, to the bottom. The packer is seated.

Q. Now, is that packer seated in some precise place? Let's assume it is a casing water shut-off test and it has

(Testimony of Frank E. O'Neill)

been perforated for a test. Is the packer always seated in some precise relationship or almost precise relationship to those perforations? A. Above the perforations.

Q. I mean in distance, is that measured or not?

A. I wouldn't say it is measured. It is approximately 3 or 10 feet above the perforations; approximately that, sir.

Q. What would be the variance? I mean, you are able, aren't you, in running a tester in a hole to seat the packer at some precise level in the casing? A. Yes.

Q. Some precise horizon? [299]

A. Yes, you are able to do it. What governs it, frankly, is where the last stand of drill pipe comes on the derrick. If to seat the packer down very close to the holes would require putting up another joint of drill pipe so that the test would have to be operated where the go-devil is dropped from way up on the derrick, it is quite inconvenient that way. Sometimes they will forego four or five feet—

Q. I mean after the packer is seated.

A. (Continuing): —and work from the floor.

Q. After the packer is set, it is set at some place where the operator knows approximately where it is set above the perforations; is that correct?

A. That is correct, sir.

Q. Assuming the well has been perforated and the packer is set above the perforations and the tester is open

(Testimony of Frank E. O'Neill)

to take a test, what is the first fluid, if any, which will enter the testing tool for recovery as part of the sample?

A. The mud fluid from below the packer. The mud fluid below the packer would enter first.

Q. To what level,—I mean, to what extent would it enter with reference to the position of the perforations?

A. To the bottom of the perforations or slightly below the lowest perforations.

Q. Now, in the ordinary practice of taking tests, does the entrance of that amount of mud fluid mask the test? [300]

A. No.

Q. Or mask the sample so that the results of the tests cannot be determined?

A. No.

Q. In other words, that is a measured amount of contaminating fluid that enters the tool, which can be compensated for with the samples recovered from the tool; is that correct?

A. That is correct.

Q. Now, with the Johnston tester, Mr. O'Neil, when the packer is released and the tool functions in its normal manner, is any fluid that had been confined above the packer any of that fluid permitted to enter the tool?

A. Not above the main valve.

Q. That is what I mean. —and permitted to enter and contaminate the sample?

A. No, sir.

Q. In other words, the sample above the valve contains none of the fluid that was in the annulus between the tool and the casing, above the packer

A. That is correct.

(Testimony of Frank E. O'Neill)

Q. Now, the Johnston tester that you operated sometime after March, 1933, what type of packers did you employ personally?

A. I personally ran casing packers and I ran a rat hole [301] or cone packer. I personally didn't operate a straight wall packer.

Q. Did you supervise any operation using it?

A. Oh, yes, I supervised the operation of a great many of them.

Q. Now, in each of those instances will you tell us, please, whether or not the packer on the Johnston tester was for the purpose of dividing the well bore into an upper and lower zone?

A. That is correct, sir.

Q. And that was the function of the packers?

A. That is the function of the packers.

Q. Now, on these Johnston tools you have been testifying to, in each instance the main valve is operated from the surface of the ground, it is opened to admit fluid and closed to entrap the sample above the valve by manipulation of the tubing of the drill stem at the surface of the well?

A. That is correct.

The Court: We will suspend at this time until tomorrow morning at 10:00 o'clock. You may step down.

The trial will be in recess until tomorrow morning at 10:00 o'clock.

(Whereupon, at 3:50 o'clock p. m., Wednesday, July 16, 1947, an adjournment was taken until 10:00 o'clock a. m., Thursday, July 17, 1947.) [302]

Los Angeles, California

Thursday, July 17, 1947.

10:00 A. M.

The Court: Please call the calendar.

The Clerk: No. 5295, M. O. Johnston Oil Field Service Corporation v. Lane-Wells Company, for further trial.

Mr. Mellin: Your Honor please, at this time we would like to have a stipulation from opposing counsel that defendant, Lane-Wells Company, was the owner of the Mims patent, No. 1,582,184 issued April 27, 1926 from 1932 to the expiration of that patent.

The Court: Will you identify that by exhibit number?

Mr. Mellin: That is Exhibit 17-G, your Honor.

The Court: For identification.

Mr. Foster: What was the date of ownership?

Mr. Mellin: From approximately 1932.

The Court: Is it so stipulated?

Mr. Foster: I would like to investigate that, Mr. Mellin. It is my understanding that the defendant owned the patent at some time, but I believe in the first stages that there may have been a license. I will investigate that.

Mr. Mellin: Will you give me those facts at noon? My information was that it was from 1932.

Mr. Foster: If you have a copy of the assignment—

Mr. Mellin: I don't have, but I wanted to ask for the admission to save the proof. [304]

Mr. Foster: Yes.

Mr. Mellin: Mr. O'Neill, will you take the stand?

FRANK E. O'NEILL,

called as a witness by and on behalf of the plaintiff, having been previously sworn, resumed the stand and testified further as follows:

Direct Examination (Resumed)

By Mr. Mellin:

Q. Do you have with you a copy of Exhibit 20 and the various patents that comprise that exhibit before you, Mr. O'Neill?

Mr. Foster: Exhibit 20?

Q. By Mr. Mellin: Exhibit 17. I beg your pardon.

A. Yes, sir.

Q. Now, will you turn to the Burr & Wakelee patent, No. 68,350, patented September 3, 1867, which is Exhibit 17-A, for identification, and tell us briefly what type of device is there disclosed.

A. The device disclosed is a device for testing wells, and in the title it says for testing deep wells. It contains two packer members.

Q. Are they large B? A. Large B.

Q. And are they spaced apart?

A. Yes, sir, they are spaced apart. [305]

Q. Will you tell us whether or not they are intended to be expanded into contact with the wall of the well to divide the well into a central zone, a lower zone and an upper zone? A. They are.

Q. And are they capable of being contracted and withdrawn from the well?

Mr. Foster: That is objected to. These questions are leading, your Honor.

Mr. Mellin: I am just trying to shorten it.

(Testimony of Frank E. O'Neill)

The Court: They are leading. If there is any issue on any of it, I will sustain the objection.

Mr. Foster: I think it is an improper method of proof. The witness has read the patent and he could answer the general question first put to him to disclose the device there described, without putting the language of the claims in his mouth.

The Court: Objection sustained.

Q. By Mr. Mellin: All right. Mr. O'Neill, will you take from that patent and from the description of the drawings and describe the apparatus therein disclosed and its mode of operation and the results it was intended to produce? [306]

A. This device for testing an oil well is composed of two packers which are spaced apart, maintained in their spacing by plates between the packers. There is an opening for the fluid to be let into the tube on which the packers are mounted.

This device does not intend to trap a sample as far as I can determine, to bring the sample out as entrapped, but the sample would be taken in some other way.

Q. What is the function of the packers B?

A. The function of the packer B at the top and B at the lower end, the upper packer to hold up the hydrostatic head above that packer and prevent its access to any point below that packer. In other words, to pack off the annulus between the body of the tool and the wall of the well.

Q. What about the lower packer B?

A. And the function of the lower packer is to pack off in that position anything that is below the lower packer to prevent the fluid from below the lower packer, while

(Testimony of Frank E. O'Neill)

the top packer prevents the fluid from above the top packer entering the zone in between the packers in which it is intended to take the test, as the patent reads, "from siphon L."

Q. And what are the conditions of these packers when they are lowered into the well bore, Mr. O'Neill?

A. They are unexpanded. [307]

Q. And what is their condition in the well bore when the tool is to be operated?

A. The packers are expanded to fill the annulus and press against the wall of the well.

The Court: By "wall of the well" do you mean the interior of the casing or would it be so whether there was a casing or not?

The Witness: Well, I believe, sir, it would be in either case. It would operate either way, whether there was casing in the well or not.

The Court: It would be intended to by this patent.

The Witness: Yes, sir.

Q. By Mr. Mellin: Now, will you turn to the Franklin, patent, Letters Patent No. 263,330, patent issued August 29, 1882, and tell us, please, briefly, what that device is?

A. The device is entitled: "A device for regulating the flow of oil wells."

Mr. Foster: Is that the complete title? Are you quoting there?

The Witness: "Controlling and regulating the flow of oil wells." It is composed of a rotary type of valve which is adapted to be operated from the surface of the well.

Q. By Mr. Mellin: In what fashion?

A. Surface of the ground.

(Testimony of Frank E. O'Neill)

Q. In what fashion, Mr. O'Neill, is that valve to be [308] operated?

A. It is rotated in one direction.

The Court: By rotating the pipe?

The Witness: By rotating the tubing or pipe, sir, at the surface in one direction to operate the valve, and in the opposite direction to close the valve.

Q. By Mr. Mellin: And does this patent teach you the use of a packer below that valve to divide the well bore into an upper and lower zone?

A. The patent doesn't show such a packer but the patent, the language says that it is adapted to be run above a packer.

Q. Is this, in your opinion, in your opinion is this device capable or incapable of taking a sample of fluid from a well casing?

A. This device is capable of taking a sample of fluid from the well casing.

Q. And removing it from the well?

A. Removing it from the well, yes, sir.

The Court: Where would the sample come from? The bottom of the well?

The Witness: It would come from below a packer which would be placed below this device. It would be used in conjunction, sir, and would take it—would merely serve as an entrance valve and trap valve both, for the fluid below [309] the packer.

The Court: You would set a packer below the valve and cut off the hydrostatic head and then presumably the pressure of the formation fluid would cause it to rise through the tubing and through the valve, if open, up to the surface?

(Testimony of Frank E. O'Neill)

The Witness: That is correct, sir, or up to where the pressure would bring it.

The Court: Or it could rise above the valve and then the valve could be closed and the tubing and valve removed from the well?

The Witness: That is correct.

The Court: In that way you could trap the sample?

The Witness: Yes, sir.

Q. By Mr. Mellin: I hand you a model which is labeled "Franklin Device, Letters Patent No. 263,330," and ask you if that, on a small scale, accurately represents the disclosures of the Franklin patent?

A. This model has with it a packer—

Q. As taught in that patent, Mr. O'Neill?

A. Which is mentioned in the patent but which is not shown in the patent drawings. From the packer up the model is exactly like the drawing shown in the patent.

Q. And then the upper part of it is the valve above the packer? [310]

A. The valve is above the packer and this represents the connection to the tubing above it, this collar, so a tubing may be connected above to reach to the surface of the well, while between the packer and the bottom of this tapered member, which is shown here as B in the patent, there is a connection for tubing to go to the packer and then from there down tubing if needed.

Q. And then by rotating the collar up at the top of the device a partial turn in one direction you open the valve?

A. That is correct.

Q. And a partial turn in the opposite direction you close the valve?

A. That is correct.

(Testimony of Frank E. O'Neill)

Q. So that a sample may be removed to the surface?

A. That is correct, sir.

Mr. Mellin: I offer the model in evidence as Plaintiff's Exhibit 20.

Mr. Foster: May I ask, your Honor, whether or not the model is to scale with the drawings of the Franklin patent?

The Court: You may.

The Witness: The model was made from the drawings and by proportional measurements. I didn't have the dimensions from which I could make a scale model as to so many inches, but by taking the proportion to the tube and proportion to the housing of the valve the model was so constructed. [311]

Mr. Foster: In other words, the patent drawing of the Franklin patent was used as a working drawing and you just increased the scale somewhat but kept all the dimensions in proportion in building the model?

The Witness: That is correct, sir.

The Court: Is there an objection?

Mr. Foster: The model, I notice, has a collar at the top which is not shown in the patent drawing.

The Witness: You are quite right about that, Mr. Foster. The collar at the top is not shown in the patent drawing. It was put on there with the idea that tubing could be so connected.

Mr. Foster: The objection, then, is it is not a duplicate of the device illustrated in the Franklin patent, your Honor.

The Court: Will you show me the collar?

The Witness: It is the member that is screwed to the top of it.

(Testimony of Frank E. O'Neill)

Mr. Mellin: Let me have the collar. Let the record note that the witness removed the collar and has now changed the device offered in evidence as Plaintiff's Exhibit 20.

The Court: The collar is merely a connecting link in the pipe or tubing, is that it?

The Witness: That is correct, sir, just to connect the suspended tubing to it. [312]

The Court: It has an interior thread by which it can be joined to another tubing—so the ends of two pieces of tubing or pipe can be joined together?

The Witness: That is correct.

Mr. Foster: Are there any other additions or omissions as regards the model with respect to the device illustrated in the Franklin drawing?

The Witness: I mentioned the packer, sir.

Mr. Foster: Yes.

The Court: Is that all? Let the record show the collar has been removed and the witness has exposed the threads at the top end of the tubing. Is that correct?

The Witness: That is correct. The threads are shown at the top end of the member A-prime in Figures 1 and 2, both.

The Court: Of the Franklin patent?

The Witness: Yes, sir.

The Court: Exhibit 17-B for identification.

The Witness: Exhibit 17-B for identification, yes, sir.

The Court: Objection overruled and the model of the Franklin patent will be received in evidence and marked Plaintiff's Exhibit 20.

(The model referred to was marked Plaintiff's Exhibit 20, and was received in evidence.)

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: Do you know of your own knowledge, [313] Mr. O'Neill, whether or not a device constructed in accordance with this Franklin patent, that is, in accordance with the drawings and teachings of the Franklin patent, as this model was made, if a full size device was ever manufactured? A. Yes.

Q. And that was manufactured by whom?

A. By the M. O. Johnston Company, the plaintiff here.

Q. And to your knowledge was that tool operated to obtain a sample in a deep well bore?

A. It was operated to obtain a sample. I was not personally present at the test but I was in supervision of the work at the time and it was operated to obtain a sample. [314]

Mr. Foster: I move to strike all of the testimony of the witness with respect to any operation of the test on the ground it now all appears to be hearsay.

The Court: Were the tests taken under your supervision?

The Witness: Yes, sir. I was general manager at the time, supervising the work and had the model constructed.

The Court: When was the test taken?

The Witness: The test was taken in about 1934, your Honor. I can fix the date because it was taken prior to a patent suit between the Johnston people and the Halliburton people. The test was run for one of the oil companies and accepted and paid for.

The Court: In the course of your business?

The Witness: In the course of business, yes, sir.

Mr. Foster: I move to strike that also, your Honor. I think we are entitled to have presented here the wit-

(Testimony of Frank E. O'Neill)

nesses who made the test, so that we may cross-examine them. It is all clearly hearsay so far as Mr. O'Neill is concerned.

The Court: The motion is granted.

Q. By Mr. Mellin: Will you turn to the McGregor patent, Mr. O'Neill?

The Court: Both motions are granted.

Q. By Mr. Mellin: (Continuing): That is Exhibit 17-C, for identification. A. Yes, sir. [315]

Q. And tell us briefly what type of device is disclosed there.

Mr. Mellin: Your Honor please, so that I understand the court's ruling, all of the testimony with respect to the Franklin tool was stricken?

The Court: No, with respect to the test.

Mr. Mellin: Yes, but not the testimony with respect to the fact that he knew of his knowledge that such a tool was built?

The Court: Mr. Foster's motion was really two motions. He directed it to two separate portions of the witness' answer with respect to the test, so to have the record clear I said both motions would be granted. The intention is to strike the testimony relating the facts of the test with the Franklin device and the result of the test with the Franklin device.

Mr. Mellin: Yes.

Q. By Mr. Mellin: Now, the McGregor patent, No. 582,828, patented May 18, 1897, that is Exhibit 17-C, for identification, will you briefly tell us what that device is?

A. It is a device for securing materials and objects from subaqueous bottoms.

(Testimony of Frank E. O'Neill)

Q. What does the drawing show in respect to the subaqueous bottoms? Does it show it as a bore into the earth?

A. Yes, the device actually was designed to be run into core drilling holes, in which there was fluid for the purpose, [316] the primary purpose of recovering from the bottom of the core drilling holes the diamonds which were lost from the diamond drill.

Q. The general device is a tubing E, is it?

A. The device itself is marked F in Figure 2 of the drawing, and is spoken of or described in the patent as a lifter, and it is connected to the bottom of a string of tubing.

Q. Large E, in Figure 1?

A. Large E in Figure 1, by a connector at D. The device assembled is lowered into the well. In the assembly is included a ball valve shown in Figure 2, marked at little f.

Q. Is that a downwardly seating ball or an upwardly seating ball?

A. It is a downwardly seating ball, and the device is sealed on the bottom by a frangible member shown at G.

Q. What condition is the interior of the pipe E or the device in, when it is lowered into the bore? Is it empty or full?

A. It is empty. The sealing member—

Q. Well, now,—go ahead. I didn't mean to interrupt you.

A. The sealing member G prevents fluid from entering, and the pipe E, as it is lowered into the bore, has atmospheric pressure. [317]

(Testimony of Frank E. O'Neill)

Q. What is the condition of the bore surrounding the tubing when it is lowered into the bore? Is it full of fluid or not?

A. It is full of fluid, as illustrated at B in Figure 2.

Q. Now, when the device has been lowered to the bottom of the well and you desire to open the device, how do you then proceed?

A. The device is lowered until it is almost at the bottom of the well. Then the tubing is dropped, permitting the frangible cover G to be broken. At that time the hydrostatic head of fluid in the well would rush in through the broken cover, lifting the ball f—that is small f—and proceeding on into the tubing, sweeping with it—it would come in with such force and velocity that it would sweep with it the diamond shown at C in the bottom of Figure 2, sweeping it in past the ball, where it would be trapped for removing it from the hole.

Q. Then the device is lifted out of the hole, is it?

A. The device is removed from the hole.

Q. And in that respect in what function does the ball valve f act?

A. The ball valve f acts to prevent the fluid leaking out of, or the diamond, rather, coming out of the bottom of the lifter as the tool is being removed from the hole. [318]

Q. Will you turn to the Cooper patent, No. 1,000,583, patented August 15, 1911, and tell us briefly what that patent discloses with reference particularly to the disclosure of the packer therein? Tell us what type of packer is disclosed, if one is disclosed in the patent.

A. The patent is for a packer for operating gas, water and oil wells. The type of packer is what is known

(Testimony of Frank E. O'Neill)

as an inflatable packer. In other words, it is a hollow sleeve, into which fluid may be placed or allowed to go by means of a tube shown at 8 in Figure 1. Fluid may be poured into that and inflate the packer. The purpose of the packer is the purpose of all the packers, which is to pack off the hydrostatic head from the test area.

Q. Now, will you turn to the Cox patent, Exhibit 17-E, for identification, and tell us briefly what that device is.

A. The Cox patent is a device for testing wells for oil or gas, and so forth, and it employs a packer.

Q. Is that the packer 9? Wait a minute.

A. No, it isn't 9.

Q. 10? A. 10 is the packer, shown in Figure 1.

Q. What type, general type of packer is this?

A. That is on the order of a straight wall packer.

Q. Is that operable to pack off in casing or not?

A. Well, it would be difficult to use that packer in [319] casing without some support below it. This packer is adapted to be dropped against the bottom of the hole, and collapse the packer, allowing the perforated member 8, as the packer collapses upwardly, to break the frangible disk at 13a, which seals the tool as it goes into the well, and the perforated member then passing through the disk plunges into the formation at the bottom of the well, from which it takes its sample. The packer would be difficult—it could be used at the very shoe of the casing, if you had formation immediately below the bottom of the shoe that you are going to test.

Q. Is this device intended to entrap a sample?

A. Well, I think it was intended to entrap a sample, sir.

Testimony of Frank E. O'Neill)

Q. What does the patent say is the function of valve 15?
A. The valve 15 is for entrapping the sample.

Q. For removal from the bore?

A. For removal from the bore.

Q. Now, will you turn to the Edwards patent, No. 1,514,585, Exhibit 17-F, for identification, and tell us what type of device is there disclosed?

A. The Edwards device is a device for testing oil wells.

Q. Does it or does it not include a packer?

A. Yes, it includes a packer shown at 5 in Figure 1. [320]

Q. What type of packer is shown?

A. The type of packer that is shown is on the order of a hook wall casing packer, employing a sleeve, a rubber or resilient sleeve instead of the individual rings as are so frequently used today.

Q. Does it employ slips or not?

A. Yes, there is a slip shown just below the packer 5. I don't see a number for the slips, but just below the packer 5 there is shown, at the exterior of the drawing, a tapered member, and just below that a member that shows dots. It looks like little dots on there. Those are slips. The tool was intended, I believe, for setting in formation. It shows the slips, however, as could be used for casing.

Q. Is that a device for testing wells, Mr. O'Neill?

A. It is, sir.

Q. Now, will you turn to the Mims patent, No. 1,582,884, issued April 27, 1926, and tell us what that discloses, please?
A. 17-G, sir?

(Testimony of Frank E. O'Neill)

Q. Exhibit 17-G, for identification, yes.

A. It is a patent for a method and means for perforating well casings.

Q. And the device that is disclosed in the drawing, will you please explain that to us, and explain the manner in which it is lowered into the well, and the general manner in which the exploding of the cartridges or the powder charges [321] is effected?

A. Well, the device is shown in Figure 1 as it would be lowered into the well.

Q. How is it lowered into the well?

A. By the cable.

Q. 20?

A. The cable 20, and along beside the cable 20 is an electric line 15 for electrically firing the apparatus when the operator is ready to fire.

In Figure 2 the device is shown with the ring 18, to which the cable 20 is attached in order to lower the device into the well, and at 15 again is shown the end of the detonating, or, the electric wire that goes to a detonating charge within the member 17, which is the plug screwed into the device, and which has the ring, supporting ring, attached to it or integral with it.

Below that point we find the projectiles 8, the barrels 10, and the sliding blocks back of the projectiles at the center of the tool marked 11, and in between those the powder charge to drive the projectiles out at 13—apparently the number is 13—so that when the connection is made through the electric wire 15, the detonating charge and the explosive charge will be exploded, the block will be driven outwardly, thrusting the bullets out of the barrel, and as the blocks pass the ports shown at 19 and

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complete their travel, the [322] excess of gas is pushed out through those ports, apparently.

Q. Now, in Figures 4 and 5, is that the same, or a similar, or different construction?

A. It is a different construction in Figure 4, in that they don't use the sliding blocks. There the device is adapted to be lowered on a line again, and at 30 and 31 we have a packing arrangement, packing gland through which the electric wire to be connected into the detonating charge at 29 is run, and we have the powder charge shown at 25, the bullet shown at 26, and the barrel is at 24. That performs the same function as the device above. It is just a different form of it.

Q. Now, the gun shown in this Mims patent is intended to be lowered into the well bore on the lower end of a cable, and after it is in place, detonated to drive the projectiles through the well casing into the formation?

A. That is right, sir. [323]

Q. Will you turn to the Steel patent, No. 1,602,864, Exhibit 17-H for identification, and tell us briefly what that device is?

A. That is a device for testing or operating oil wells which involve a packer.

Q. What number is that?

A. Shown at Figure 2 in Figure 2. Wait a minute. I am sorry, sir. It is actually shown at 5 in Figure 2 and 5 in the same number, Figure 1. It is an inflatable type of packer.

Q. And the purpose of the packer is what?

A. To pack off the hydrostatic head above the point at which it is desired to test and in this device, the language of the patent, does not confine the device to one

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packer but the patent says that they may use as many packers as they need to pack off where it is desired, so it could be used as one, two or more packers if desired.

Q. Now, will you turn to the Irwin patent, No. 1,652,472. That is Exhibit 17-I for identification. And tell us briefly what type of device is there disclosed?

A. That is a device for obtaining samples of fluid and for determining the point of fluid entry in a well—finding leaks in well casings.

Q. Is this device to be lowered in on tubing or is it to be lowered in on a line? [324]

A. This device is lowered in on a line.

Q. Will you state whether or not it has any packer on it or packers?

A. Yes. It has packer members at 17 shown in Figure 1. That is two packer members above and 2, 17, packer members below, and in between those packer members it has a perforated tube for permitting fluid to enter from the zone between the packer members.

Q. What is the ordinary term applied in the oil fields to the type of packer shown here—that is where you have packers spaced apart to have an isolated zone between the packers?

A. Well, that packer member in the oil field would probably be referred to as a swab rubber.

Q. I don't mean that. I mean where you have space packers apart. A. Straddle packers, sir.

Q. And the meaning of that is to straddle some opening or perforation, that is, to isolate them from above and below the packers?

A. That is correct, to pack off below and also above a zone to be tested or spot to be tested.

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Q. Now, will you refer to the Harris patent, No. 2,683,303, 17-G for identification, and briefly tell us what that device is? [325]

A. The Harris patent discloses a device for testing oil and gas wells.

Q. Is it the type of device for flow testing or taking a sample?

A. It was intended to take a sample. It contains or embodies a packer shown at 6 of the Cone type, to be seated on the shoulder in the well bore shown at 8, to pack off the hydrostatic head above the packer.

It contains a perforated anchor below, shown at 10. The perforation is shown at 11, and the device is adapted to be run—

Q. Is the lower end of the device in open or in closed condition when it is run into the well?

A. It is to be adapted to be run in closed.

Q. And how is that closure effected?

A. By a frangible cap, shown at 18, which is held in place by a member, 19.

Q. And in that—when that enclosure is employed what is the condition of the interior of the tool or tubing above it? Is it full or empty?

A. It is empty. It is at atmospheric pressure.

Q. And now will you explain to us how, if the seal, 8, is ruptured the sample is admitted into the tubing?

A. Well, the seal is broken or ruptured by dropping the member shown in Figure 1 as 22, which is a form of go- [326] devil that is used in the field. That passes down through the empty pipe and strikes the disc.

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Q. Disc 18?

A. 18; and fractures the disc to permit the fluid from below to enter into the low pressure chamber above.

Q. Now, I notice a ball valve, 23, in Figure 3. What is the function of that ball valve or the intended function of it?

A. The intended function of the ball valve at 23, is to be dropped in at the conclusion of the test to trap the sample obtained within the drill pipe or tubing.

Q. And when is the ball valve put in place? Before or after the sample has entered the tubing?

A. After the sample has entered the tubing.

Q. And it seeps downwardly, does it?

A. It seeps downwardly.

The Court: In other words, they drop the go-devil, 22, down through the pipe and it breaks that frangible covering 18?

The Witness: Yes, sir.

The Court: And the sample presumably enters?

The Witness: Yes, sir, it enters.

The Court: Enters through the opening in the tubing?

The Witness: That is correct.

The Court: And after, presumably, enough fluid has [327] entered to make the test whoever drops the go-devil then drops the ball bearing and closes the valve?

A. That is correct.

Q. Drops it from the surface down through the tubing and presumably it lodges in the opening through which the fluid entered?

A. There is a tapered member shown at 13 in which the ball valve would seep down. The ball valve, according to the wording of the patent, is preferably coated with

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something like tar or something of the kind, but it is still a ball valve and is dropped for that purpose.

Q. By Mr. Mellin: Now, will you turn to the Burstall patent, No. 1,710,203, April 23rd, 1929, 17-K for identification.

A. Yes.

Q. And tell us what that patent discloses.

A. That patent discloses in Figure 1, a hook wall packer with slips and bow springs on it and the packer, while it shows just one packing member marked B in Figure 1 and B in Figure 2, it is a flexible or resilient member which is adapted to be pressed between the plate 2, the upper member 2, and the lower member b.

Q. How is this member expanded, Mr. O'Neill?

A. The slips shown at 14 in Figure 1 are released by a turn. For instance, the pin at Figure—as shown at 11 in [328] Figure 1 would be within the hook at 13 as the tool was run into the well, and by a turn the pin is turned out of that hook and by lowering the device then the slips have been released so they may take hold of the pipe and the pressure down from above the pipe against the resilient member, which is held from moving downwardly by the slips, expand the resilient member.

The Court: A telescoping arrangement whereby the portion above B can telescope into the portion below?

The Witness: Yes, it is a telescoping arrangement.

The Court: Tapered and telescoping arrangement?

The Witness: It is tapered where it contacts the resilient member and the telescoping member passing from the top member, rigidly attached to the top member, and passing down through, with respect to the lower member below the resilient member B, so that pressure from above would cause the upper member, which is marked 2, along with its sleeve, which is attached at the thread 4

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in Figure 2. And which is shown as 5 in Figure 2, to move downwardly with respect to the member which is shown as small b on the right-hand side of Figure 2.

The Court: It would be akin to mashing a rubber ring flat, around rubber ring flat?

The Witness: Yes, sir, it is almost what it is, too.

Q. By Mr. Mellin: Now, does that packer have the same [329] or a different function than the packer used by the M. O. Johnston Company in its well tester?

A. Well, that has the same function, to pack off the hydrostatic head above from the test below.

Q. How does it compare in mode of operation?

A. But it operates just the same way as a casing packer does, by rotation of the tubing to unlatch the slips.

Q. Now, will you refer to the Johnston patent No. 1,790,424, 17-L for identification? A. Yes, sir.

Q. Tell us generally what that device is?

A. That is a device for testing oil wells.

Q. And by testing oil wells will you state whether or not it is a device for testing oil wells by obtaining and removing a sample of fluid from the formation to the top of the well?

A. It is, sir. The device is adapted to be lowered in on a tube, shown at B in Figure 1 at the top of the figure. It contains a packer, shown at O in Figure 1. It has a shoulder in the well bore, shown at A little zero—it is marked Ao, whichever you want to call it, in the figure. And the packer is adapted to be set on the shoulder to pack off the hydrostatic head above that shoulder from having access to the zone below the packer and by a downward movement of the drill pipe to open

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the valve shown at [330] E, which is an upwardly seating valve, seating against the member M, in order that fluid from below the packer may enter through the ports marked little d1. d1 is shown at the lower left side of Figure 1.

The mandrel to which the valve head E is attached is marked capital D-1. The fluid enters the ports at small d-1, and passes upwardly into the tubing and at the conclusion of a test, by lifting on the tubing at the surface of the well, the tubing B, the valve member is pulled upward, assisted by the spring R, that large coil spring in the upper portion of the drawing, and is pulled against the seat M to close the tool following the test and to thereby entrap the sample.

The Court: That is an upwardly closing valve?

The Witness: Yes, sir, it is an upwardly seating valve.

Mr. Mellin: The valve in the present Johnston tester is also an upwardly seating valve?

A. That is correct, sir.

Q. And the function of the valve in this patent, as you have just described generally, that is, it is an upwardly seating valve through the relieving of the weight on the drill pipe at the surface?

A. That is correct.

Q. And to rap a sample?

A. That is correct, sir. [331]

Q. Now, will you turn to the Rembert patent, Patent No. 1,835,722, December 8th, 1931, 17-M for identification. And will you briefly tell us the manner in which—the purpose of that device and the general manner in which it is constructed and functions?

A. The Rembert device, this patent discloses a casing perforator for oil wells. It has a trigger member by

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which—I said “casing perforator”. I should have said casing gun perforator. It has a trigger member by which the projectiles may be fired.

The trigger member is shown in part in Figure 1 at 25, which is a vertical rod from which, shown in Figure 2, there is a plate, 28, disposed angularly—not quite horizontally, from the rod.

The Court: Which part of the figure is that shown in?

The Witness: That, sir, is the central circle. Not the little circle. The little circle is the rod 37, but the large central circle just at 28.

The Court: I see it now.

The Witness: That is the disc and in the disc is cut a slot marked 34, which slot is adapted to receive the rod 37.

The device contains gun barrels at 16 in Figure 4, screwed into the body, which is shown at 11 in Figure 1; and I don't know whether the number is repeated in Figure 4, but [332] it is the large outside cross hatched area there. The body has curb sides with rollers mounted on them as at 13 and 14, and flat sides as at 12 in Figure 4.

And the gun barrel is adapted to receive a cartridge, fixed ammunition as shown here at 15 in Figure 4.

The trigger rod shown back at 25 in Figure 1, carries on the detent pins, which possibly could best be seen in Figure 6, which is another form of device. In other words, the first form showed only the one gun barrel while Figure 6 shows the possibility of using multiple gun barrels and in the firing the hammer which fires the gun would be shown in the same Figure 6 at 21-a.

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It is a spring device which is held in a cocked position by virtue of the detent pins attached to the trigger rod and shown at 24-a in the Figure 6.

In Figure 5, near the lower part of the figure and immediately behind the projectile 15 or the cartridge 15, is shown a firing pin, a little plunger.

The Court: Is that 19?

The Witness: At 19, sir. It is adapted to be struck by the hammer or the spring hammer at 21 and driven into the percussion cap in the cartridge shown, the cartridge 15. I am not sure I have a number for the percussion cap but it would be in the back end of the cartridge 15. And in that way to explode the powder charge and drive the projectile [333] out horizontally against the casing.

The thing is operated by, returning now to Figure 5, lowering a weight down against the plate 28 as shown here. He shows a slot 34 marked and the plate 28 on the left marked, so that when the weight reaches 28 that portion of the trigger mechanism would be depressed, causing, by virtue of the pivot shown at 33 in Figure 5, causing the portion of the trigger mechanism marked 25, to be raised and thereby removing the detent pin 24, from in front of the hammer and permitting the hammer to fly forward and strike the plunger for exploding the cap.

Q. By Mr. Mellin: How is the device suspended in the well bore?

A. The device can be—may be suspended in the well bore either by a line or tubing. The language of the patent tells that the device is adapted to be lowered into

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the well casing in any suitable manner by means attached to rod 37 or otherwise.

Q. Now, will you turn to the Miller patent, No. 17-N for identification, No. 1,837,788, December 22nd, 1931, and tell us, generally, what type of device is there disclosed?

A. The device there disclosed is an oil well testing device.

Q. For what type of testing, Mr. O'Neill? [334]

A. For testing, this identical one here, for testing in formation. It shows a shoulder packer for setting and rat hole tester.

Q. What is the purpose of the packer—is that the packer, 21?

A. The packer is at 21.

Q. That engages what?

A. That packer is held from downward movement by the plate 17 which in turn rests against the shoulder within the well bore shown at 18. This is in Figure 2. And the weight of the pipe, 10, is transmitted downwardly to the upper retaining member of the packer 16, causing the packer to be compressed longitudinally and to be expanded laterally and pressed against the wall of the well.

The Court: Would you call that a conical packer?

The Witness: This isn't a conical packer. Possibly I said it was conical, but really it isn't. It is more of a straight wall type of packer, sir. He is not setting the resilient member against the shoulder. He is setting a member, a steel member, 17, against the shoulder and expanding the packer actually above the shoulder, so it is more of a straight wall type than a conical type.

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Q. By Mr. Mellin: Now, will you turn to the Johnston patent, 17-O for identification, issued January 19th, 1932 on an application made June 19th, 1931, and tell us generally [335] what type of device is there disclosed?

A. That is a device for formation testing of an oil well by means of a packer and a valve to entrap a sample in the tubing so that the sample may be withdrawn for examination.

Q. Does it include an upwardly seating valve for entrapping the sample?

A. Yes, it includes an upwardly seating valve shown at—

Q. And what is the purpose of packer 9?

A. I am sorry, I did not hear your question.

(Question read.)

A. The packer 9 is for the same purpose that I have recited for packers before, for packing off the hydrostatic head above the packer and preventing that from having access to the rate hole shown at 6, so that it could have access to the tool itself and to prevent the hydrostatic head from having access actually to the testing device.

Q. Will you state whether or not the rat hole is part of the well bore ordinarily?

A. Yes, definitely is a part of the well bore.

Q. Now, in what fashion was the instrument by which the valve generally, indicated at 35 and with the operation 37, is operated in order to admit fluid to the tool and to entrap fluid into the tool above the valve? [336]

A. By manipulating the pipe above it by lowering it down and raising it up.

Q. That is the tubing 45?

A. Tubing 46 it seems to be.

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Q. Yes, 46.

A. 45 is just a collar connecting.

Q. Now, what is the comparison between the function or the purpose of the valve, the main valve here or the valve 35 and its ports 37? And the seat 34? How does it function? And what is the purpose of the valve—compare the function and the purpose of the main valve with the present-day Johnston tester.

A. The function and the purpose are identical, sir.

The Court: How does it compare with the valve which you described in Exhibit 17-L for identification, which is the Johnston patent, 1,790,424?

The Witness: It is the same, sir. It is identically the same. The valve shown in this 1,790,424 is located below the packer but it functions identically the same.

Q. By Mr. Mellin: Now, still referring to—

Mr. Mellin: Did the court get the information it desired?

The Court: I take it you mean by that it operates in the same manner?

The Witness: Yes, sir. [337]

Mr. Mellin: Referring to Exhibit 17-O. There is an additional valve structure just above the packer. What is the purpose of that valve structure?

A. You are referring to the valve structure which is marked 24, 25 and 28?

Q. By Mr. Mellin: Yes.

A. In Figure 2?

Q. That is correct, yes.

A. The purpose of that valve structure was actually two-fold. One, to act as a by-pass valve in assisting—in getting the packer down and also to act as an equalizing

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valve for releasing the hydrostatic head from above the packer into the zone below the packer for equalizing the pressure above and below the packer so that the packer might be more readily removed from its seat at the conclusion of the test.

Q. And how does the purpose of this valve you just described in this patent 17-O, compare with the purpose of what you termed the equalizing valve in the present-day Johnston tester?

A. It is the same purpose, sir.

Q. Now, will you turn to the Fortune patent, Patent No. 1,853,557, April 12th, 1932, Exhibit 17-T for identification, and tells us generally what the device there discloses?

A. The device disclosed in the patent to J. C. [338] Fortune, that is, 17-T for identification, is a formation testing device for the purpose of running into a well, packing off the hydrostatic head of fluid above the zone to be tested, taking a sample from the zone to be tested, trapping the sample and bringing or removing it from the well for examination. [339]

Q. Will you state whether or not that device includes a packer?

A. It includes a packer shown at 11 in Figures 1, 2 and 3.

Q. And the function of that packer is what?

A. To pack off the annulus between the body of the device and the wall of the well in order to hold up the hydrostatic head and prevent the hydrostatic pressure being exerted against the formation being tested.

Q. Now, I refer you to the Johnston patent, No. 1,901,813, Exhibit 17-Q, for identification, and ask you if generally that tool functions in the same manner as

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the Johnston patent,—so far as the valves are concerned functions in the same manner as the Johnston patent, Exhibit 17-O, for identification,—generally?

A. Oh, yes, sir.

Q. Will you point out whether there is a difference in the construction of the equalizing valve?

A. Yes, there is a difference in the construction of the equalizing valve. It is for the same purpose. The equalizing valve structure shown in 17-O, for identification, and member 28 seats downwardly on to the member 21 to close the ports shown at 28. Did I say member 28, sir? I meant No. 25 seats downwardly on member 21 so as to close the ports 28, to prevent fluid from the annulus leaking through into the [340] test zone, and upon raising the tools at the surface, or, the tubing, that member is pushed off of the seat and does permit the fluid to come through to equalize, whereas in the—

The Court: Before you leave Exhibit 17-O, for identification,—

The Witness: Yes, sir.

The Court: —as to that valve, how is it originally opened, by manipulation of the tubing from the top?

The Witness: Yes, sir.

The Court: It is opened on the turning?

The Witness: No. This valve is opened, and by using this kind of packer it isn't necessary to turn. The turn is purely to set the slips on a casing packer.

The Court: How is the valve in Exhibit 17-O, for identification,—how is that equalizing valve opened originally?

The Witness: By just picking up on the tubing. It is manipulated by the tubing. It telescopes—

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The Court: Would it be opened, then, as the device is lowered into the well?

The Witness: Yes, sir, it could be. It would be opened by lowering into the well, that is correct. It would not have any effect on the valves above it. It would assist in fluid by-passing the packer in going into the well. The fluid would go into the ports at 12 at the anchor and up [341] through the packer, the mandrel in the packer which would come out at 28, through those ports, and assist in lowering the packer without too much compression. It would be open going into the well, sir.

The Court: It would be open in entering the well, and, of course, as the device is removed from the well, it would also be open?

The Witness: That is correct, sir.

Q. By Mr. Mellin: Will you refer to Figure 6 in Exhibit 17-Q, for identification, and I will ask you what is the element 38? A. Figure 6?

Q. It appears to be a packer?

A. It is a packer, sir.

Q. And how is that expanded?

A. That is just an expandable straight wall packer. By pressure from above, being lowered down onto the resilient member and the resilient member is held from moving downwardly by the member 39, so that the mandrel passing through the resilient member, which is the packer 38, telescopes downwardly and compresses the member, the resilient member, between an upper and lower plate, expanding it laterally.

Q. Now, will you turn to the Simmons patent, No. 1,930,987 of October 17, 1933, on an application filed

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February 10, 1926, and tell us what that patent discloses. [342]

A. 17-S, for identification, sir?

Q. 17-S, for identification, yes.

A. It discloses a method and apparatus for testing oil wells or gas wells or water wells.

Q. What type of test is intended to be taken by the Simmons tool? Is that supposed to be a flow test or a test by removing the sample from the well?

A. It is supposed to be a test that would take the fluid, whether it flows or not, and remove a sample from the well by packing off the hydrostatic head.

Q. Will you tell us by reference to the drawing how that tool is constructed and operates?

A. The tool in Figure 1 shows a cone-shaped packer at 15. In that figure the tool is shown partly in section and partly in elevation. Now, in the section, in the left-hand side of the Figure 1 we show an upper member which in Figure 2 is marked 19 and through which ports 17 pass. That upper member has passed through the member shown in Figure 2 as 4 now, with the stem 7, and the ports 5 and 6 in Figure 2. They are assembled together in Figure 1, and the ports are shown in alignment. The upper member 19 is adapted to rotate on the stem of member 4, that is, on 7.

Q. Mr. O'Neill, may I interrupt you there? Did you cause a model, a scale model, to be made of the tool shown in the Simmons patent? [343]

A. Yes, sir.

Q. Is this the one which I hand you?

A. That is right, sir.

Q. Does that conform to the disclosure of the Simmons patent?

A. Yes, sir, it does.

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Q. And is that built in accordance with the drawings of the Simmons patents? A. It is.

Mr. Mellin: I will offer that in evidence as Plaintiff's next in order.

Mr. Foster: The collar isn't shown in the drawings, is it?

Mr. Mellin: Well, we will leave the collar on, and you can argue it.

The Witness: The collar is indicated in Figure 1 by broken lines, sir.

Mr. Mellin. It is offered in evidence.

The Court: Is there objection?

Mr. Foster: May we see that?

(The instrument was handed to counsel.)

Mr. Foster: No objection.

The Clerk: Exhibit 21 in evidence.

(The model referred was marked Plaintiff's Exhibit 21, and was received in evidence.) [344]

The Court: That is the model of the Simmons patent?

Mr. Mellin: That is correct.

The Court: Described in Exhibit 17-S, for identification?

Mr. Mellin: Yes, your Honor.

Q. By Mr. Mellin: Taking that model, Mr. O'Neill, and from the drawing could you show us how it functions, the device functions, to take a sample of fluid from a well bore?

A. The device is adapted to be lowered in on tubing or drill pipe, and the packer seated, in this particular type of packer, cone packer, seated on a shoulder within the well bore, and at that time, when it is desirable to take the test, after the hydrostatic head has been packed off

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and held up by the packer by rotation of the drill pipe in one direction to open the valve by aligning the ports shown there, as I mention, at 17 and at 5 in Figure 5, and also shown at 18 and at 6 in Figure 1, permitting the fluid from below the packer to pass through the ports so aligned, and into the tubing above and on up into the well tubing; and at the conclusion of the test to rotate the device in the opposite direction and throw the ports out of alignment.

The Court: Thereby, in effect, closing the valves?

The Witness: Thereby closing the valves to trap your sample, yes, sir.

Q. By Mr. Mellin: Is that valve opened to admit fluid [345] to the tool above the packer by means of manipulation of the tubing string on which the tool is suspended in the hole? A. It is, sir.

Q. And is that adapted to be closed to entrap the sample above the packer by manipulation of the tubing at the surface of the well? A. It is, sir.

Q. And state whether or not that packer is adapted to divide the well bore into an upper and lower zone?

A. It is, sir.

Q. Now, will you refer to the Johnston patent, which you have already identified as Exhibit 17-U, as corresponding with the device in suit, or the tester or apparatus in suit, and I want to call your attention particularly to Figures 4 and 5 and ask you what type of packer is there disclosed?

A. This is patent No. 2,073,107, sir?

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Q. Yes, sir. That is Exhibit 17-U, for identification, and referring to Figures 4 and 5.

A. Figures 4 and 5 both disclose a hook wall type, a hook wall casing packer of a by-pass type, a packer to be set in casing.

Q. Now, will you refer next to the Neitzel patent, reissue No. 16,991, originally filed April 18, 1927, and tell us what type of device is there disclosed?

The Court: What exhibit number is that? [346]

Mr. Mellin: That is Exhibit 17-V, for identification, your Honor.

The Witness: That is a device for testing formations in oil wells. It is equipped in the patent drawing with a conical packer marked 10, and with valve parts in Figure 1 marked 15 and at 14, which ports can be brought into registry by manipulation of the drill pipe, lowering it down against the packer, and which may be brought out of registry or closed by picking up on the packer.

The Court: By "registry," do you mean alignment?

The Witness: Alignment, yes, sir.

The Court: Does that take the sample from above the packer or below the packer?

The Witness: No, sir.

The Court: The fluid would probably rise in the inner tubing from the rat hole up through the valves, and then be admitted by the valves into the upper tubing?

The Witness: That is correct, sir.

The Court: Into the tubing above the valves?

The Witness: That is right, sir.

Q. By Mr. Mellin: Now, will you refer to the Macready patent, Exhibit 17-W, for identification, reissue

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No. 19,963, originally filed July 5, 1922, and tell us generally what type of device is there disclosed?

A. That is a testing device for oil wells. It is for [347] obtaining samples from oil wells.

Q. Now, referring you to Figure 15, and calling your attention particularly to the ball 33,—

A. Yes, sir.

Q. —what is the purpose and function of that ball?

A. That ball is dropped into the tubing at the conclusion of the test, with the idea of trapping a sample in the tubing.

Q. That is to seat downwardly, is it?

A. Yes, sir, it is a downwardly seating ball.

Mr. Mellin: Now, your Honor, the book of patents, Plaintiff's Exhibit 20,—

The Court: You mean Exhibit 17?

Mr. Mellin: —17—I am sorry—and each of the patents therein contained, Exhibits 17-A to 17-W, inclusive, are offered in evidence.

Mr. Foster: Some of the patents this witness has not referred to. They have not been identified.

Mr. Mellin: Which ones, Mr. Foster?

Mr. Foster: Well, 17-R.

The Court: Exhibit 17-R, for identification, is which patent now? That is Wells patent No. 1,926,017?

Mr. Foster: Yes, your Honor.

Mr. Mellin: Well, we will refer to that. I am sorry. I must have missed it in going through. [348]

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Q. By Mr. Mellin: Will you turn to Exhibit 17-R, for identification, and I will ask you to tell us what type of tool is disclosed therein?

A. That is a hook wall casing packer, sir, of a by-pass type.

Q. Is that generally of the type of packer which is used in the Johnston tester, as made today?

A. Of that general type, sir.

Q. That is a by-pass wall packer, yes.

Q. Will you refer to—I must have passed another one up here—the Johnston patent, Exhibit 17-T, for identification, No. 2,048,451, and I will ask you what type of device is therein disclosed.

A. That is a casing perforator gun, to be lowered in on a line and fired electrically.

Q. And its bullets propelled out of the gun into the casing by the admission of powder charges?

A. Yes, sir.

Q. How, in general type, does the gun therein disclosed compare with the general type of electrically fired guns used today, Mr. O'Neill, if you know? Do you know?

A. Well, in general, sir. The mechanical details of them I wouldn't know, but in general they are for the same purpose and operate in general alike. [349]

Q. In other words, is this the type of gun that has been referred to herein as a line gun?

A. Yes, it is a line gun.

Q. And the meaning of that is what?

A. That the gun is lowered into the well on a line or a cable instead of on tubing or drill pipe.

(Testimony of Frank E. O'Neill)

Q. And an electrical circuit is established through a conductor 14, that extends downwardly through the well bore to initiate the firing?

A. That is correct, sir. That serves as a lowering line and a firing line, both.

Mr. Mellin: The patents, Exhibits 17-A to 17-W, inclusive, your Honor, are offered in evidence under the same numbers they were offered for identification. [350]

* * * * *

The Court: I will receive in evidence Exhibits 17-A to 17-T, inclusive, and Exhibits 17-V and 17-W for all purposes offered.

(The documents and articles referred to were marked as Plaintiff's Exhibits 17-A to 17-T, inclusive, and Exhibits 17-V and 17-W, and were received in evidence.)

The Court: As to Exhibit 17-U for identification, that will be admitted for the limited purpose of illustrating the [365] testimony given by the witnesses Johnston and O'Neill.

If you desire to make further offer later you may do so.

(The document referred to as Plaintiff's Exhibit 17-U was received in evidence.)

Mr. Mellin: All right, your Honor.

Q. By Mr. Mellin: Now, Mr. O'Neill, will you refer to the Mims patent, No. 1,582,184, Exhibit 17-G for identification and to the Simmons patent, 17-S for identification, and tell us whether or not you can assemble them or connect them together so that they can be run into a well bore at the same time for operation?

(Testimony of Frank E. O'Neill)

Mr. Foster: That is objected to as immaterial. What the plaintiff is now attempting to do, your Honor, obviously is to have an expert with hindsight and a full disclosure of the patents in suit, mosaically pieced together in a manner suggested by none of these prior patents, elements from some of them to provide the device of the patent in suit.

The Court: He is asking him what is perfectly obvious. That is, from these models here whether you can screw one into the other—whether you can screw two pieces of pipe together is what it amounts to.

Mr. Foster: And whether or not he can do it now. We urge that as being immaterial. [366]

Mr. Mellin: That goes to the weight.

Mr. Foster: They have not proved it was done before our inventions and the fact they can do it now in the light of the disclosure of our inventions is immaterial.

The Court: Isn't it material to know whether or not it can be done and, secondly, how simply it can be done as indicating whether or not it is something new?

Mr. Foster: Not if it was all done after our inventions, your Honor. There is no suggestion here that this was done before our inventions and the fact that one can easily do it who is acquainted with the disclosures of our patents has nothing to do with the prior art or invalidating the patents. It isn't suggested this was done before our inventions. This gentleman is testifying about prior art and now Mr. Mellin is asking him to piece it together—to piece together the different patents in a manner suggested by none of them but obviously in the light of the suggestion of the combination of our patents. What materiality that has I cannot see.

(Testimony of Frank E. O'Neill)

The Court: Suppose someone invented the idea of putting a bucket on the end of a rope to bring water out of a water well and had it patented? Later someone thought of hooking the second bucket beneath the first bucket and thereby bringing up two buckets of water at one time and a patent was granted on that. As to the validity of the second patent [367] wouldn't it be material to inquire what was involved in the second operation, as to whether it was anything new and thus whether it constituted an invention?

Mr. Foster: Well, the newness I think is—that feature of the case, if this is all prior art that Mr. Mellin intends to introduce, that is answered by saying no one before Lane or Spencer did combine the separate elements into a combined tool such as they did.

Now, they are seeking through an expert who is familiar with our patents and our suggestions, to select elements from different prior patents, in a manner disclosed by none of them or contemplated by none of them, and combining them. There is lack of materiality for that reason and I urge my objection.

The Court: Objection overruled. You may answer.

Mr. Mellin: Will you read the question?

(Question read.)

A. Yes, sir.

Q. By Mr. Mellin: Will you tell us, please, the manner in which you would connect the two together so that they may be simultaneously run into a well bore and so that each could perform their separate duty, one of perforating and the other of testing the well? Did you make a drawing showing the manner in which you could connect them? A. Yes, sir. [368]

(Testimony of Frank E. O'Neill)

Q. And is this the drawing which I show you?

A. Yes, sir.

Q. Do you have an enlargement of that drawing?

A. Yes, sir.

Mr. Mellin: May I have this drawing marked for identification, please?

The Clerk: Plaintiff's Exhibit 22 for identification.

(The drawing referred to was marked as Plaintiff's Exhibit 22, for identification.)

Mr. Foster: I haven't, of course, seen it yet. Do you have a copy of it?

Mr. Mellin: No, I don't, but you will have one later on.

Mr. Foster: That is all right.

Q. By Mr. Mellin: Is this the enlargement that you referred to?

The Witness: Yes, sir.

Mr. Mellin: May I have the small drawing and the enlargement marked for identification, your Honor?

Mr. Harris: What will be the numbers on those, Mr. Mellin?

The Court: The small drawing has been marked Plaintiff's Exhibit 22 for identification, and the large one will be marked Exhibit 23 for identification. [369]

(The drawing referred to was marked as Plaintiff's Exhibit 23, for identification.)

The Court: That is a drawing of the witness' opinion as to how the Mims gun, depicted in 17-G, can be attached to the Simmons tester, Exhibit 17-S, is that correct?

The Witness: Yes, sir, that is correct.

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: Now, from the drawings 22 and 23 for identification, Mr. O'Neill, will you explain to us, please, how you connect the two together?

A. (No answer.)

Mr. Mellin: If your Honor please, may the witness step to the enlarged chart?

The Court: He may.

A. The Simmons device is shown here.

Q. By Mr. Mellin: Just a moment, Mr. O'Neill. Does the drawing you made, except for the showing of a cable downwardly through the Simmons device and the changes necessary for that and the changes necessary to suspend the gun from it, conform to the drawings of the Simmons patent? A. Yes, sir.

Q. And does the drawing of the Mims gun at the bottom conform to the drawings of the Mims patent?

A. Yes, sir.

Q. All right. Now, from that point on will you explain, please, first, what you did—what it was necessary [370] to do in order to combine the two devices together, referring at any time to the teachings in the patents where you find that taught?

A. As far as the Mims gun is concerned no change was necessary in the gun. Mims in his patent showed how to suspend the gun and the gun could be merely tied by cable to the bottom of the Simmons device or it could be suspended rigidly if need be, but Mims shows how to tie it to a cable and suspend it from a cable. It could be suspended as well from the Simmons device.

Q. The Simmons device that you refer to is the device in Simmons patent, Exhibit 17-S? A. Yes, sir.

(Testimony of Frank E. O'Neill)

Q. Go ahead.

A. Then in order to connect the wiring, the Mims being electrically fired, to bring the wiring through where it may be fired from the surface it would be necessary to drill through the cap at the bottom of the perforated anchor of the Simmons device and also to drill a hole through the central stem of the Simmons device through which the wire would be threaded, and to install packing glands to prevent leaks. That way the wire would be brought on up to the surface.

Q. Now, what change had to be made—point out precisely the change that had to be made in the Simmons device or the device in the Simmons patent, in order to connect the [371] two together. As I understand it, you first referred to drilling a hole through the lower end of the cap at the lower end of the perforated anchor?

A. That is correct.

Q. And then drilling a hole upwardly through the center of the stem of the Simmons tool, is that correct?

A. That is right, sir.

Q. Then I notice that you put packing at each end of that hole. What is the purpose of that and why is that there?

A. To prevent leakage of fluid from above the packer into the test zone.

Q. Then I notice that you have the cable or the electrical conductor passing out through the side of the collar at the top of the Simmons device?

A. That is right, sir.

Q. And that the collar which is shown in the patent in the dotted lines—

A. At 23, as I recall the number.

(Testimony of Frank E. O'Neill)

Q. 23? A. I haven't it before me.

Q. And I also notice you have packing there to prevent leakage, is that so?

A. To prevent leakage from the drilling fluid into the tool above the valve. [372]

Q. Now, that main valve, is that described? Will you state whether or not that is described by Simmons to admit fluid upwardly through the tool and through the packer into the tubing when it is opened?

A. That is correct, sir.

Q. And that valve also has the purpose of being closed so as to entrap the sample which had been previously obtained in the tubing above the packer and above the valve? A. That is right, sir.

Q. Now, please describe to us the operation of this assembled Mims gun and Simmons tester, briefly?

A. The two devices so assembled would be lowered into the hole, lowered by means of the tubing and the electric line played out from the surface as the device is lowered until such a time that we reach the point where we wish to fire the perforator, and at that time, by closing a switch on the surface, the electrical energy would be furnished to the Mims gun to fire the projectiles. If a test is desired the packer could be set, the packer shown is a packer for a rat hole or shoulder, the packer set and you take your test in a normal manner, rotating the tubing at the surface to open the valve and rotating it in the opposite direction to close the valve and trap the sand.

Q. As a matter of fact, in making a casing test, to test above the gun, would you use a conical packer such as is [373] shown in Simmons?

A. No, not for a casing test.

(Testimony of Frank E. O'Neill)

Q. You would have applied some other packer, would you, or not?

A. Yes, sir, I would have applied some other packer, either a hook wall packer, possibly a regular casing packer could be used.

Q. Now, in your opinion, Mr. O'Neill, would a combination of the Simmons tester and the Mims gun be operative when assembled as you have shown, an operative structure? A. Yes, it would be operative. [374]

* * * * *

Q. Mr. O'Neill, with reference to the drawings, Plaintiff's Exhibits 22 and 23, for identification, showing the Mims gun combined with the Simmons tester, will you state whether or not there is any modification of the operation of the Simmons tester by such combination or connecting together?

A. None whatsoever, sir.

Q. And is the operation of the Mims gun modified or changed in any manner because of its connection with the Simmons tester? A. Not at all, sir.

Q. Is there any co-operation between the two, that is, is there any intermutuality of operation of the two, other than being run into the hole and removed from the hole together? A. That is all, sir.

Q. When that assembled tool is run into the hole, the gun performs its separate function in perforating does it not? [375] A. Yes, sir.

Q. And the tester performs its same old function of testing? A. That is correct, sir.

Q. And neither one is modified by the operation of the other? A. That is right.

(Testimony of Frank E. O'Neill)

Mr. Mellin: I offer the drawings, Exhibits 22 and 23, for identification, in evidence to illustrate the witness' testimony.

The Court: Plaintiff's Exhibits 22 and 23, for identification, are received in evidence.

The Clerk: So marked.

(The drawings, heretofore marked Plaintiff's Exhibits 22 and 23, for identification, were received in evidence.)

Q. By Mr. Mellin: I hand you copies of the patents in suit and of the prior art. Mr. O'Neill, copies of the exhibits.

The Court: That is Exhibits 1 and 2 and 17?

Mr. Mellin: That is right, your Honor.

Q. By Mr. Mellin: Mr. O'Neill, in your opinion was the problem presented to you of connecting the Simmons tester and the Mims gun one which you solved by means of your mechanical skill?

Mr. Foster: That is objected to as uncertain and indefinite [376] as to what is meant by "mechanical skill."

The Court: Sustained in that form. He may state how he did it.

Q. By Mr. Mellin: Mr. O'Neill, will you state whether or not it required any experimentation on your part to combine the Mims gun and the Simmons tester?

A. No. it was just hooking them together.

Q. Now, will you turn to Exhibit 1, which is the Lane patent in suit, and I have before you on the easel an enlargement of the drawing of the Lane patent. You have examined it, haven't you?

A. Yes, sir.

(Testimony of Frank E. O'Neill)

Q. And it is an exact duplicate of the drawing of the Lane patent except it has been enlarged?

A. It is just an enlargement.

Mr. Mellin: May I have that marked, for identification, your Honor?

The Clerk: 24, for identification.

(The enlarged drawing referred to was marked Plaintiff's Exhibit 24, for identification.) [377]

Mr. Mellin: May I offer it in evidence as Exhibit 24?

The Court: It is an enlargement of the drawing which comprises a part of the plaintiff's Exhibit 1, is that correct?

Mr. Mellin: That is right, yes.

The Court: It will be received. In evidence as Exhibit 24.

(The document referred to was marked Plaintiff Exhibit 24, and was received in evidence.)

Q. By Mr. Mellin: Now, Mr. O'Neill, from the Lane patent, Exhibit 1, and from Exhibit 24, would you briefly explain to us the operation of the device in the patent in suit as you understand it from the description and drawing?

Mr. Foster: If the court please, the witness has not testified he has read or studied the Lane patent.

The Court: Please lay the foundation.

Q. By Mr. Mellin: Have you studied the Lane patent in suit, Exhibit 1? A. Yes, sir.

Q. And do you understand the construction and operation of the device there disclosed and described?

A. Yes, sir.

(Testimony of Frank E. O'Neill)

Q. All right. Now, from Exhibit 1 and from Exhibit 24 will you please tell us briefly, the construction of the device and its mode of operation? [378]

Mr. Mellin: If your Honor please, may the witness approach the chart?

The Court: Yes.

A. The Lane device includes a tubing 3 shown in Figure 1, by which the device is suspended and by which it is lowered into the well or withdrawn from the well.

It includes a hook wall casing packer shown as Figure 2—at No. 2, I am sorry, in Figure 1.

It further includes a seat for the ball valve shown in Figure 2 at 1-b and the ball of the same valve, 28, in Figure 2.

Q. Now, Mr. O'Neill, in Figure 2 the tubing 2 is the tubing at the bottom of the hook wall packer in Figure 2? A. Yes; this tubing?

Q. Yes.

A. That is correct. That is the tubing at this point at the bottom of the hook wall packer.

Q. All right.

A. Connected to the hook wall packer by screw threads is the gun mechanism for perforating the well with its attendant firing mechanism, which is shown in Figure 2. This Figure 1 shows another packer below which, according to the teaching of the patent, may or may not be used.

Q. That would only be used where they are going to use [379] it as a straddle packer for perforating between two packers? A. That is right, sir.

(Testimony of Frank E. O'Neill)

Q. And state whether or not the patent teaches that lower packer may be dispensed with so that you would merely divide the well into an upper and lower zone by means of the upper packer? A. It does, sir.

The parts assembled on the tubing are lowered into a well to the point at which it is desired to fire the gun and the gun is fired through the firing mechanism in the following way.

The mechanism includes dry cell batteries which electrically are connected, and the dry cell batteries are 14—electrically connected to a series of terminals, shown in Figure 3 at 16 and a distributor arm 18 by which the electrical energy may be transmitted to the terminals as the distributor arm is rotated by a driving mechanism, which involves a bellows, a diaphragm shown at 23 in Figure 2, a driving pawl shown at 24 in Figure 2, which by engagement with the teeth in a sleeve 21, I believe the figure is—

Q. Just a moment, Mr. O'Neill. As I understand it, there are more than one gun barrel in the gun body?

A. The device is shown with one gun barrel in this view, Figure 2. It is shown with more than one in Figure 1.

Q. And there is one gun barrel for each one of the [380] terminal 16, isn't there?

A. That is right. Each terminal is connected to a gun barrel.

Q. So that when the gun fires it fires the gun barrels successively? A. That is right.

(Testimony of Frank E. O'Neill)

Q. From the botton in upward sequence?

A. Well, it doesn't say that it fires them from the bottom in upward sequence. It says one barrel, which I will explain in a moment, is fired last.

Q. All right, go ahead.

A. And a bellows diaphragm operates the distributor arm which permits the connection to each gun barrel in the order in which they are fired, and that is operated by successive accumulations and releases of air in the tubing.

Q. How is that successive releases and accumulation of air in the tubing obtained?

A. The patent doesn't teach that. I presume from some source at the surface. The patent merely says by successive accumulations and releases of air within the tubing.

Q. And what is the effect of that operation on the switch mechanism which establishes circuits through the gun barrels?

A. When air is applied to the bellows diaphragm down [381] the tubing through this bore the ball 28 is not in this position while the air is being applied through this bore and through a valve here shown at 22a, into the bellows diaphragm. The diaphragm expands down and this pawl 24 engages a tube of this sleeve 21 and thereby rotates the sleeve and the sleeve is connected to an axle or axis which is connected through to this same distributor 18 shown here, so as the diaphragm is expanded the contact is moved from one, over one notch as it is released, and the diaphragm contracts the pawl and it disengages and a spring throws it over to engage the next tooth when the next bit of air is put in. [382]

(Testimony of Frank E. O'Neill)

So by the succession of accumulations and releases of air within the tubing the connection is made from one to the other.

The Court: Does the air enter through that valve where in Figure 2 the ball 28 is shown?

The Witness: It would have to, sir. That is the only opening.

The Court: How does the air go into it?

The Witness: The ball 28 is dropped—

The Court: That is dropped from the surface?

The Witness: That is dropped from the surface. In this particular Figure 2 it is dropped later.

The Court: It is shown in place there, but at the time the air is put in and released, as you have described, to activate the gun, the ball has not at that time been dropped?

The Witness: That is correct, sir. There is another method shown of firing the gun, shown in Figure 5, to which I will refer. There is one chamber or barrel of the gun which is sealed, along with the firing mechanism, within a sealing tube 4 shown in Figure 2, with the idea of keeping fluid from entering the annulus A between the sleeve 4, and the sleeve, multiple sleeve 13, I believe it is, which means you have the firing apparatus within the sealing sleeve, and that barrel the patent specifies must be fired last. The purpose of that barrel is that the bullet from this barrel, which is within the sealing sleeve 4, is to perforate the sealing sleeve, [383] making a hole in the sealing sleeve, which hole will act as the inlet port to the tool when the test is taken. In view of that the patent doesn't teach when the packer is to be set, but it would have to be set before that last barrel is fired.

(Testimony of Frank E. O'Neill)

Otherwise, the hydrostatic head would come in before the packer could be set.

The Court: Wouldn't the firing of the other barrel admit fluid also?

The Witness: No, sir, the other barrels are in the continuation of the gun, within the gun body, but are not within the sealing sleeve 4.

The Court: So the only test would be taken of that fluid because of the perforation made by the last barrel fired?

The Witness: That is correct. That would be the inlet to the tool.

The Court: Presumably the fluid that entered below through other perforations might rise and enter through the last perforations made?

The Witness: I think that might happen, sir. I think so.

The Court: But would that have to be inside the casing or outside?

The Witness: Well, this is adapted to run within casing, as shown here, because it shows a hook wall casing packer with [384] the metal slips for seating in the steel casing.

The Court: So presumably fluid entering the casing through perforations made below in the firing of other barrels might rise and enter through the hole, the perforation made by the last barrel fired, and constitute a part of the sample which is taken?

The Witness: That is correct. It could later happen if the formation pressure was there sufficient to cause it to enter.

(Testimony of Frank E. O'Neill)

The Court: Does the patent teach you that is the purpose of the other barrels that are fired, the multiple perforations?

The Witness: To perforate the casing to let the formation fluid come into the tool from the other barrels. This barrel is presumably to perforate the sealing sleeve, and possibly the casing also, if they can get it through both pipes.

The Court: That is the last shot fired?

The Witness: That is the last shot fired, sir, and that shot opens the entrance valve of the tool.

The Court: There would not be any other purpose to be served by the other perforations, that is, the preceding perforations being made, unless it was to admit the fluid from the formation which is sought to be tested?

The Witness: No. That is the purpose of them.

The Court: And the purpose of it would be to enable that [385] fluid to rise and enter the chamber and be captured as a part of the test; isn't that true?

The Witness: That is correct, sir. Before setting this last barrel off, the packer would have to be seated and the hydrostatic head packed off between the body of the tool and the wall of the well casing to hold that hydrostatic head, so that pressure would not be exerted on the perforations when they are made, and be exerted against the formation pressure.

Q. By Mr. Mellin: In that capacity does that packer tool serve the same purpose as packers in prior art testing?

A. Precisely. When the packer has been set by rotation of the tubing to the left, that is, to release the locking lug out of the slips, so that the slips can actuate,

(Testimony of Frank E. O'Neill)

and it is packed off, then the last barrel is fired, and that opens the tool and the fluid from the formation may enter through the bullet hole within the sealing tube 4, pass upwardly through the annulus marked A in Figure 2, in through the ports marked 13a in this inner member 13, and upwardly through the bore marked 1a, and on into the tubing, and the fluid having passed upwardly and into the tubing, as it would be at the proper time, then ball 28—

The Court: What effect does that have on 27, if any, the float?

The Witness: Oh, this float has the effect, as taught by the patent, that whenever fluid has entered this chamber—[386]

Mr. Mellin: That is the chamber surrounding the ball 27?

The Witness: The chamber surrounding the ball 27, whenever fluid has entered there, the fluid will be lifted by the float and close this valve 22a and prevent further air pressure actuating the device. It shuts the air off of the bellows diaphragm by closing that port 22a by the fluid.

Q. By Mr. Mellin: Now, when the tester has been left in that position long enough to let the test, the sample accumulate, then, as I understand you, the ball 28 is dropped from the surface to seat on the seat—

A. 1b, sir.

Q. —1b. Now, what does the patent teach you with respect to the function of ball 28 to seat on the seat, 1b?

A. It is for the purpose of trapping the sample in the tube and bringing an uncontaminated sample, a substantially uncontaminated sample to the surface.

(Testimony of Frank E. O'Neill)

Q. Now, does the patent itself teach you that the object of the ball valve 28 is to exclude the fluid in the well above the packer under the hydrostatic head, when the packer is broken, from entering the tubing tool through the passage 1a into the test sample?

A. The language of the patent says that it is to obtain an uncontaminated sample or substantially uncontaminated sample, and in order to do that the ball valve would have to [387] seat to restrain the hydrostatic head of fluid without the tool from entry into the sample.

Q. Assuming, Mr. O'Neill, that in the Lane device the amount of fluid in the tubing tool which was taken in after the gun was fired, and which would constitute the sample, is less than the amount necessary to equalize the hydrostatic head in the bore annulus surrounding the tool above the packer, what would occur, if anything, when the packer 2 is released?

Mr. Foster: Might I inquire whether this question is based upon opinion and conjecture, or based upon experience, and whether he is inviting an answer on which basis?

The Court: Is it a request for his opinion?

Mr. Mellin: It is a request for his opinion.

The Witness: In my opinion, sir, the hydrostatic head above the packer, when the packer is released, would be applied downwardly through the entry port to the tool and upwardly against the bottom of the ball, and if the hydrostatic pressure is greater than the pressure of the fluid within the tube down on the ball, the ball would be lifted and additional fluid from the drilling fluid of the hydrostatic head would enter.

The Court: Is there any equalizing valve used or shown or taught in connection with this apparatus?

The Witness: No, sir. [388]

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: Now, Mr. O'Neill, do you have with you any information showing the approximate average depths of taking a casing water shut-off test by the Johnston Company during some fixed period?

A. I had such a compilation made, sir.

Q. I hand you what purports to be a list of tests, and ask you what it is.

You can go up on the stand now, if you wish, Mr. O'Neill. What is the data recorded on these sheets that I hand you?

The Court: Before you go ahead with that and before we leave the discussion of the Lane patent,—

Mr. Mellin: I am not going to leave it. I am getting first an average well depth and pressure so that I can go into it.

The Court: Very well.

Mr. Mellin: Or would your Honor care to question him further now?

The Court: No.

Mr. Mellin: I am not leaving it.

The Court: You will probably cover what I have in mind. [389]

Q. By Mr. Mellin: What is the data on the sheets that I handed you, Mr. O'Neill?

A. This is a compilation of the test run in casing by the plaintiff company, the Johnston Company, during the month of June 1947.

On the left of the page is given the name of the company for whom the test was run and the next column, going toward the right, gives the ticket number in the Johnston run ticket book for that test.

The next column, moving towards the right, shows the depth at which the packer was set.

(Testimony of Frank E. O'Neill)

Q. Now, that is the depth given in feet, isn't it?

A. That is feet. The next column to the right, which is marked "Size of main hole" is actually the nominal casing size. That is, the casing is spoken of as a five and a half or seven-inch casing and by the API—that is the American Petroleum Institute regulations, that refers to the outside diameter of the casing. It does not mean that the bore of the casing is five and a half or seven inches because it isn't. There is a wall thickness and that varies with the weight of the pipe.

Q. All right, and what is the next column?

A. The next column shows the type of test made, whether it was a water shut-off test or a production test. Actually all the water shut-off tests are not so labeled but the production tests are labeled. [390]

Q. And what is the next column?

A. The last column toward the right shows the amount of fluid taken in and some description of the fluid in instances.

Q. Now, the amount of fluid is given in feet in rise in the drill pipe or tubing to which the tester was connected?

A. In almost every instance, sir. There are one or two places where they have given it as it was on the ticket, in stands.

Q. And when it is in a stand you would have to multiply it by the height of a stand?

A. By the length of the stand. That is a little indefinite because it is a matter of what height of rig we are working on. It might be a 90-foot stand and it might be less than that.

(Testimony of Frank E. O'Neill)

Q. Now, these figures were obtained from the records of the plaintiff, were they?

A. They were, sir.

Q. Now, from these tests did you arrive at an approximate average depth at which a water shut-off test was made during the month of June by the Johnston Company?

A. I did, sir.

Q. And what is that average figure?

A. The average depth at which the packer was set was [391] 4,581 feet. Approximately 4600 feet.

Q. What was the average rise of the sample fluid in the tubing during the same period as shown by these records?

Mr. Foster: I object to that. I anticipated before he got to the figures that plaintiff's counsel would offer this compilation in evidence. I think that any use of this information is unwarranted and objectionable on the ground that it is only a compilation. It apparanetly was not made by this witness. There is no showing that he performed all of the tests that are set forth, the source from which the compilation is made is not produced for the inspection of counsel, and hence, I think the use of the figures in the manner now contemplated by counsel is as objectionable as the compilation itself.

The Court: Did you compile these figures yourself from records made in the course of business of the plaintiff company?

The Witness: I had them compiled by the men who keep the records.

The Court: Whose duty it is to keep the records?

The Witness: Yes, sir.

The Court: Is this information that is required to be kept in connection with each test made?

(Testimony of Frank E. O'Neill)

The Witness: Yes, sir.

The Court: And customarily kept? [392]

The Witness: Customarily kept, yes, sir.

The Court: Over what period of time?

The Witness: It has always been kept.

The Court: For a number of years?

The Witness: For a number of years, yes, sir.

The Court: What is the purpose of it?

Mr. Mellin: Going to show an average in order to further explain the Lane tool and the fact that valve 28 will not operate. I am going to take the average of these depths and have him testify from that as to what would occur in the Lane tool at an average depth well merely to illustrate his testimony that the ball valve 28 is not operative.

The Court: Wouldn't that depend upon how much of a hydrostatic head was present?

Mr. Mellin: Hydrostatic head, that is true. That is exactly what I am going to show.

The Court: It might be one thing in one well and another thing in another.

Mr. Mellin: That is right. That is why the document here shows the hydrostatic head.

The Court: Would there be anything to prevent, for instance, the person using the other tool from lowering the pressure by pumping it out?

Mr. Mellin: You mean pumping out the hydrostatic head?

The Court: Some of it. [393]

Mr. Mellin: I think the testimony shows that that is never done if they run it down to that point. Our theory is, your Honor, as explained to the court in my opening statement, that before this ball valve can function to

(Testimony of Frank E. O'Neill)

keep out the hydrostatic head of fluid, the stand of fluid in this tubing must be of equal pressure so as to equalize the hydrostatic head.

The Court: That would be a physical fact, I take it, and if the court had judicial knowledge of it it could take judicial note of it as a physical fact. But I do not know what aid these data would be to us.

Mr. Mellin: Well, this data shows you that over—of course one of our contentions, your Honor, is that this tool, even if it had been made, would be of no practical benefit to the industry because they could never get a test or sample and the compilation shows the average test made in California over a period of one month. Now, in some of those—

The Court: This witness, I take it, is an expert and testifies as to pressure exerted at a certain depth by the hydrostatic head in the well and as to the pressure exerted by a column of test fluid of a certain height. That is all we would need to know, isn't it?

Mr. Mellin: Yes, your Honor.

The Court: I will tell you right now from my limited [394] knowledge of physics and hence limited judicial knowledge on the subject, I would take judicial notice as a physical fact, that unless the pressure inside the tube plus the weight of the ball equal the pressure from the outside, the ball would be inclined to rise from the seat of the valve and admit other fluid to equalize the pressure. I think that is an elementary physical fact, isn't it?

Mr. Mellin: We think it is, too, but I would like to offer this compilation in evidence to show how much fluid normally, that is, over a course of time, over a period of months in taking the casing tests over perforations was

(Testimony of Frank E. O'Neill)

the usual rise of fluid in this tubing and for that purpose, as a part of the record, the plaintiff offers that in evidence as Plaintiff's next in order.

The Court: Is there any showing in the use of the Johnston apparatus that the tester permits the fluid to rise as high as it will rise in the tester?

Mr. Mellin: That is the testimony I want to offer to your Honor. It usually is in water shut-off tests. Usually let it stand until it won't take any more water.

The Court: I take it you could ask his opinion as an expert; but these data would seem only to be reasons for his opinion. In other words, he might go out and test 40 wells and he finds in a certain field—I suppose it depends upon the gas pressure, doesn't it? [395]

Mr. Mellin: Well, it may and may not, your Honor. For example, in taking a water shut-off test they sometimes get but three feet of water in there over a period of time. They may get more or they may get a smaller amount or they may get a small amount of salt water in the tubing and then if they break the packing the hydrostatic head would enter until it equalized the pressure. It is our contention this device is not operative and that is exactly what I wanted to show by this witness. And I also wanted to show the velocities under hydrostatic pressure which are normally encountered in wells. These fluids change or vary from 75 feet, 26 feet, 200 feet, 35 feet, 22 feet, 23 feet, 30 feet, 63 feet, 40 feet, 50 feet, and all different heights of rises of fluid and then the sheet also shows in red occasional mis-runs of the tool when the packer fails to hold or when there is a leak in the tool above.

Now, I want to put this in evidence to show that in normal operations in these fields that this tool would be

(Testimony of Frank E. O'Neill)

of not practical benefit to the industry because it cannot make a sample which is uncontaminated to the extent it would furnish information.

The Court: I take it the witness can testify as to what the weight of the column of this drilling mud or fluid is, the hydrostatic pressure under varying circumstances, and also the pressure given by a column comprising the test [396] fluid, plus the weight of the ball and if we have that the rest of it naturally follows, doesn't it?

Mr. Mellin: The only thing is, I wanted to show the average rise of fluid in that tubing as a basis for asking this witness a hypothetical question with respect to weights and velocities.

The Court: Why don't you ask him? He is an expert. But do not ask him to offer data on which he bases his opinion. What you are offering now is data on which he bases his opinion, isn't it?

Q. By Mr. Mellin: Mr. O'Neill, assuming that a well bore was drilled and cased and the packer was set at a normal distance above the bottom at the 4500-foot level.

The Court: What would be "a normal distance above the bottom."?

The Witness: Anything like six, eight or ten feet above the bottom of the pipe, up inside of the bottom joint of the pipe and we try to keep the actual parts of the tool, of the anchor from being too far out of the pipe for the danger of running into sand and catching it. We try to keep it at the bottom. That would put the packer the length of the anchor and part of the mandrel would be packed up off in this five, six or eight or ten feet.

The Court: You are referring now to a casing test?

(Testimony of Frank E. O'Neill)

The Witness: Yes, sir, we are referring to a casing [397] test.

Q. By Mr. Mellin: Then assume that the packer has been set at that level and assume that the mud level of the drilling fluid in the casing is approximately at the surface and that in the tubing above the packer there was a rise of fluid of 600 feet.

Now, I show you a diagram and ask you if that diagram illustrates the assumptions which I have made?

A. Yes, sir.

Mr. Mellin: May I have that marked for identification, your Honor?

The Court: Yes.

The Clerk: Plaintiff's Exhibit 25 for identification.

(The diagram referred to was marked as Plaintiff's Exhibit 25, for identification.)

Mr. Mellin: I will give you a copy, Mr. Foster.

Q. By Mr. Mellin: And assuming that the lower end of that tubing is closed by a ball valve downwardly seated and that the tubing in the interior and that the fluid in the interior of the tubing rose 600 feet and at that point what would be the hydrostatic head of fluid on the packer?

A. The hydrostatic head of fluid on the packer?

Q. Yes.

A. That is while the packer is set, I take it?

Q. While it is set, yes. [398]

A. You set your packer at 4500 feet so you would have 4500 feet of fluid and the average of—well, fluids now, drilling mud will vary. We always run with the annulus full to the surface so we can consider a full column of drilling fluid, I think. That is always up there for safety purposes. And for the average of mud used

(Testimony of Frank E. O'Neill)

in the field it would probably be about 80 pounds to the cubic foot. We divide that by 144 and we would come out a little bit over a half pound of hydrostatic pressure exerted for each lineal foot of depth.

Q. So that would be— A. Of fluid.

Q. So that would give you a pressure on top of the packer of how much?

A. About 2,250 pounds per square inch.

Q. A little over a ton per square inch of pressure?

A. Yes, sir.

Q. So that under those circumstances if this tool were set at that depth as is shown on that chart—

The Court: That is the Lane tool?

Mr. Mellin: The Lane tool as shown in the Figure 2, the pressure on the packer tube downwardly by the hydrostatic head would be 2,250 pounds per square inch?

A. Approximately that.

Q. If the sample fluid that was at a head of 600 [399] feet and that was salt water what would the pressure of that be on top of valve 28?

A. Well, salt water of course would be a little bit heavier than pure water. I frankly don't know the figure for salt water, but pure water would be about .434 pounds per square inch per lineal foot of depth and say it is .5 it would only be 300 pounds of fluid pressure downward per square inch on the ball.

Q. In other words, under those circumstances there would be a downward pressure of 300 pounds per square inch on the ball but 2,250 pounds per square inch on top of the packer? A. Yes, sir.

(Testimony of Frank E. O'Neill)

Q. Now, assume that the packer is released what would occur, if anything, under those conditions?

A. Well, the differential heads there would cause the fluid from the high pressure side to go into the tool and raise the ball. The ball would weigh, probably, three or four or five pounds, depending on the size of it. It might be less than that. So that weight of the ball added to the weight of the column of fluid inside there would be the force holding back the hydrostatic head and the hydrostatic head itself would be exerted at the bottom of the ball and the ball would move upward and let the hydrostatic head in.

Q. Now, have you calculated under those conditions [400] and the situation just as I have given it to you and shown on the chart, the approximate velocity of the entry of that mud fluid from the hydrostatic head after the packer had been released in the tool and through the ball seat?

A. I first made an approximate calculation for the entry of fluid into the tube 4 through the bullet hole made by the last gun fired, which was a sealed-in gun. The fluid entering there would have to rise and pass up through the annulus above. Now, in the patent I did not have any dimension for the orifice at 1a but—

The Court: That is the opening beneath the ball 28?

The Witness: Yes.

Q. By Mr. Mellin: This space here?

A. Yes, sir.

The Court: 2 of Figure 1.

(Testimony of Frank E. O'Neill)

Q. By Mr. Mellin: Will you state whether or not the companies require the tool to ordinarily be beaned?

A. In almost every instance the company for whom we are making the test will require that we use a choke orifice for an inlet to the tool.

Q. And what is the average diameter of that or usual diameter of the choke?

A. Well, some companies specify a quarter of an inch and some specify $3/8$ ths. I think occasionally they specify not to exceed a half inch but the average or most common one [401] is $3/8$ ths-inch diameter bean or choke.

Q. And assuming, then, that that orifice 1a below the ball 28 in the Lane device to be $3/8$ ths of an inch in diameter, did you calculate the velocity of the fluid entering through there under the conditions, the initial velocity under the conditions I have given you?

A. Approximately, sir. I estimated it to be about 400 feet a second.

Q. That is 400 feet a second velocity?

A. That is the way I figured.

Q. Do you happen to know what the velocity of the fluid discharge on a fireman's hose nozzle is in the City of Los Angeles?

Mr. Foster: I object to that as wholly immaterial and irrelevant.

The Court: It might help me to comprehend the figure. Objection overruled.

The Witness: The pressure on the fire hose is about 150 pounds.

Q. By Mr. Mellin: That is pounds per square inch?

A. Yes, and the nozzles vary from a quarter inch to $15/16$ ths, and you can compute the velocity under that head. It is approximately 145 or 150 feet second.

(Testimony of Frank E. O'Neill)

Q. 145 to 150 feet per second?

A. Approximately that. [402]

Q. So under your calculations, under the conditions I have given you, the initial velocity of the mud fluid entering that tubing would be over twice that of the velocity of the discharge from a fire hose in a municipal department such as in Los Angeles?

A. Yes, I think so.

Q. Now, of course, that is the initial velocity, isn't it, Mr. O'Neill?

A. That is correct.

Q. And that progressively decreases in velocity as the fluid here rises to equalize the load—that is to equalize the hydrostatic head?

A. Yes, the fluid would tend, when that packer was pulled loose, to fall between the well casing and the tubing, but the operator would not permit that. That is dangerous. So they pump fluid in all the time and keep that full, so the thing would tend to decrease, would tend to decrease your velocity—the thing that would tend to decrease your velocity would be the rising of the mud in the tube and not the double fall and rising, just the rising. It is the differential head that will produce the velocity.

Q. Now, is the fluid that you take in from the formation either in a water shut-off test or in a formation test, ordinarily of greater or lesser specific gravity than the fluid in the casing, the drilling mud in the casing? [403]

A. The fluid from the formation is almost always of lesser specific gravity than the drilling fluid that we are using at the hydrostatic head.

(Testimony of Frank E. O'Neill)

Q. The reason for that is to keep the well from blowing out?

A. Yes, that is one of the reasons. That may be said. There are exceptions to that last statement I made, Mr. Mellin. In some instances they might use a drilling fluid that wasn't really any heavier than the oil.

Q. Are those the instances where they use oil as a driving fluid?

A. Those are the instances where they use oil as a driving fluid or an oil base mud which has a great deal of oil in it. That would be a little heavier but oil may be used as a drilling fluid and in those instances, why, the drilling fluid would be very little heavier than the fluid taken in, but that would be in the minority of cases.

* * * * *

Q. By Mr. Mellin: Under those conditions, Mr. O'Neill, [404] that is, the conditions shown in the diagram that we have just been discussing and assuming that the packer had been released and the hydrostatic head has entered the bottom of the tool, will you state whether or not the sample which had been previously taken would be masked?

Mr. Foster: The same objection—indefinite as to the use of the term masked. [405]

Q. By Mr. Mellin: What does the word "masked" mean in connection with the sample, Mr. O'Neill?

A. It would mean the same as it would in connection with a person. The actual identity is more or less not visible, you could not determine it from its visible appearance; the contents of the sample, in other words.

The Court: Percentagewise or in proportion, how much contamination of the drilling mud and other foreign

(Testimony of Frank E. O'Neill)

matter may be present in the sample and still not ruin the test?

A. I am not sure exactly that I can answer that in a percentage figure.

The Court: Isn't there a tolerance that is accepted out of experience?

The Witness: Well, out of experience, primarily in visual examination and possibly in an examination from a mechanical point of view. For instance, they might be using a drilling fluid that would contain a certain amount of salt in it, and maybe they took in a small amount of water and they got some drilling fluid with it. If the contents showed a very great increase of salt content, they would assume salt water had been added to it through the sands. But, frankly, I couldn't say that there is a percentage beyond which they wouldn't permit it. It would depend to a great extent on the quantities probably involved, too.

The Court: I suppose so, but if you were taking a test, [406] and as I understand it, always with any device that is known it will admit ahead of the test sample some of this drilling mud and fluid?

The Witness: That is correct, from below the packer.

The Court: Now, if you took the packer and it stood 10 feet high in the tube, and 3 feet of it was drilling fluid, would you throw out the test?

The Witness: No, sir.

The Court: Or if it was 10 feet out of 100 feet?

The Witness: I think not in those cases. The case might be more complicated if we had in the tubing when we got out of the hole 3,000 feet of fluid, and from what source we don't know. Or, we may have had 1,000 feet in there at the end of the test and a leak may have oc-

(Testimony of Frank E. O'Neill)

curring in coming out of the hole, and we equalized another 2,000 in. In cases of that kind we would not know how to estimate it. We would have a chemical analysis made of the fluid, but even that might not tell us. If the fluid in the tubes is so definitely of a nature like pure oil, or pure water, or it is oil and then some heavy thick mud that doesn't show any presence of water with it, in that case they would probably assume that the water was excluded. But those are tests where the test will identify itself. But we get some tests where there is nothing to identify unless we can keep out as much as possible of the extraneous well fluids. [407]

I don't know whether I have answered your question, sir.

Q. By Mr. Mellin: If the amount of foreign matter, for example, or let's take the instance, Mr. O'Neill, of the amount of fluid taken in from the well bore that is between the perforations and the packer, and you know that will enter the testing tool when the testing tool is opened over the perforations. Is that a known or an unknown quantity?

A. That is relatively or substantially a known quantity. You know about the bore of the hole that you have below your packer, and that you could compute reasonably.

Q. And then you can make compensation for that in a sample?

A. Yes, that could be compensated for, sir.

Q. Now, if the amount of fluid taken in is considerably great, and it is in an unknown quantity, such as the hydrostatic head driving the mud fluid in behind the sample, would you be able to compensate for that quantity in determining whether the sample is satisfactory to you or not?

(Testimony of Frank E. O'Neill)

Mr. Foster: That is objected to unless "considerably great" is defined.

Mr. Mellin: Let's say 500 feet.

The Court: Does that meet your objection?

Mr. Foster: He hasn't said how great the sample is above this mud entering the tube, and I think that should be determined. [408]

Mr. Mellin: We will say 500 feet.

The Witness: Then definitely in answering that, sir, when I come out of the hole with the fluid I have 1,000 feet of fluid. I don't know that there was 500 feet in there at the conclusion of the test unless I lower something into the well to find out. I might have 300 feet on my sheet, or might have had 100 feet on my sheet, or had 900 feet in my test, and now I have 1,000 feet of fluid. Where did it come from?

Q. By Mr. Mellin: Now, would you say, Mr. O'Neill, when the packer is released and fluid enters from the hydrostatic head, under the influence of the hydrostatic head, into the bottom of the tester, would you say that to you that would be a successful or an unsuccessful test?

A. That would be an unsuccessful test to me.

The Court: Then, in your opinion, no formation tester would be a successfully devised tester unless it would exclude from the sample,—through its operation exclude all fluid other than the relatively known portion of drilling mud that would be taken in in advance of the sample?

The Witness: That is primarily the way I feel about it, sir.

There is one instance that we haven't brought up, and I don't want to leave this impression: Sometimes in a very deep hole, where a company will not dare run their pipe that [409] deep for fear of collapsing the pipe from

(Testimony of Frank E. O'Neill)

the hydrostatic head on the outside, the company will assemble a tool, and they will say, "We will run 1,000 feet of fluid." So they will put drill pipe between the tool, except for the trip valve, and fill that with fluid, a known amount, and then set the trip valve in on top of that fluid. That is what they call a cushion to protect the pipe in very deep holes.

The Court: That is a known quantity?

The Witness: That is a know quantity, yes, sir.

The Court: Then does that alter your opinion, as I understood you to express it, that no tester is a successful or will be a successful tester unless it can be so operated as to exclude all fluid other than the known quantities or relatively known quantities in addition to the sample taken?

The Witness: That is correct, sir; absolutely correct.

Q. By Mr. Mellin: In your opinion, Mr. O'Neill, would a tester be of any practical benefit if it was not provided with a valve which would prevent the entrance of any fluid into the tester after the sample had risen in the tester above the valve?

A. I would like that question read back, please.

The Court: Please read it, Miss Reporter.

(The question was read.)

The Witness: Am I to understand that the sample has risen in the tester above the valve and the valve has been [410] closed behind it?

Q. By Mr. Mellin: Has been closed.

A. That is correct. The valve closes to keep out the drilling fluid from the sample, and if the valve won't close and do that it isn't a testing device of any utility, so far as I am concerned.

(Testimony of Frank E. O'Neill)

The Court: Then, in your opinion, this device depicted on Exhibit 1 would not be a successful tester by reason of the ball valve which is depicted as item 28 on Figure 2 of Exhibit 1?

The Witness: That is right, sir.

The Court: For the reasons that you have stated?

The Witness: For the reasons I have stated.

Q. By Mr. Mellin: Now, Mr. O'Neill, from the patent itself, that is the Lane patent, Exhibit 1, does that patent teach you anything with respect to the ability of the ball valve 28 excluding the fluid under the influence of the hydrostatic head when the packer 2 is released?

A. That Figure 5 right there (indicating)—

Q. Of the Lane patent?

A. I didn't explain that on the Lane patent.

Mr. Mellin: May he approach the diagram, your Honor?

The Court: Yes. That is Figure 5 of Exhibit 1?

The Witness: That is right, sir.

The Court: Shown on the chart, Exhibit 24. [411]

Mr. Mellin: At this time, your Honor, may I offer in evidence to illustrate the witness' testimony the diagram of the well which he referred to in connection with the hydrostatic tests?

Mr. Foster: I think it is illustrative of the assumptions of counsel. I have no objection to its being admitted for illustrative purposes.

The Court: It is illustrative of the answer of the witness in response to the hypothetical question involving counsel's assumptions.

Mr. Foster: Yes.

The Court: It is Exhibit 25, for identification, is it not?

(Testimony of Frank E. O'Neill)

Mr. Mellin: It is, your Honor.

The Court: It may be received in evidence.

(The diagram referred to, heretofore marked Plaintiff's Exhibit 25, for identification, was received in evidence.)

The Court: And at this juncture I will say that if you desire to offer the data and make a record as to the excluded evidence with respect to the experiments on the record of the plaintiff company in testing wells, I will permit it to be made a matter of record, pursuant to rule 43-C.

Mr. Mellin: I do not care to do that. I think we are proceeding along all right. [412]

Q. By Mr. Mellin: Go ahead, Mr. O'Neill.

A. The Figure 5 shown—

Q. In the Lane patent, Exhibit 1?

A. —in the Lane patent, Exhibit 1, marked Exhibit 24, for identification, is another method of firing the Lane gun in connection with the tester when there is only one barrel operated. The patent teaches that on many occasions it will only be necessary to run one gun barrel, and that gun barrel will be within the sealing tube 4. The fact that there is just one gun barrel makes it unnecessary to operate this complicated mechanism shown here for firing the multiple chambered guns, and in this instance the patent shows an electrical switch at 32, at contacts 32 and 33. It shows a rod, the lower end of which, marked at 31a, is insulated and resting against the movable part of the electric switch 32. The upper end of the rod, the rod having passed through the bellows diaphragm, the upper end of the rod extends into the annulus 1a, where it may be contacted by the ball valve 28 when the ball valve is dropped.

(Testimony of Frank E. O'Neill)

Now, this one chamber of the gun must be fired before the tool is open, and it is fired by dropping the ball. So to fire the thing, the gun, the ball 28 is dropped and strikes the rod, which is located in this annulus 1a, and the rod closes a switch which makes the connection to the single gun chamber which fires a projectile through the sealing sleeve 4, [413] thereby opening the tester to the entrance of fluid—and we assume that the packer was set before that chamber was fired, so we will say to the entrance of fluid from below the packer. In this instance the formation fluid itself must enter with the ball in place. It must lift the ball.

Q. That is the ball 28?

A. The ball 28 in order to enter. Now, if the pressure in the formation will lift the ball 28, the hydrostatic head would definitely lift it, because the hydrostatic head is either greater than the formation pressure or the well would be blowing out.

The Court: Then, in your opinion, the Lane tester with the single firing gun would never get a usable sample; is that it?

The Witness: Neither one of them would get a usable sample, the single or the multiple, in my opinion, sir.

The Court: Does the Lane patent, Exhibit 1, teach that the ball valve used in the device depicted in Figure 5, the single firing device, is the same ball valve as is pictured on Figure 2 of Exhibit 1, the multiple firing gun?

The Witness: Yes, sir. If I may read from the claims—

The Court: You don't need to read it. I am just asking you.

The Witness: Yes, sir. The ball valve 28 engages the upper end of the pin and closes the valve. [414]

(Testimony of Frank E. O'Neill)

The Court: And you assume that is the same ball that is dropped into the device pictured as in Figure 2 of Exhibit 1?

The Witness: Yes, sir, that is the same ball.

The Court: You reason from that that if the formation fluid would lift the ball to admit the formation fluid to the testing chamber, that once the packer is released upon removing of the device from the well that the pressure of the hydrostatic head would clearly force a quantity of the drilling fluid up into the testing tube as well?

The Witness: Yes, sir; as shown in Figure 5, because the ball has to be there before the fluid ever starts in.

The Court: It takes it, it is your opinion that the Johnston device is of practical use because the main valve, which admits the fluid to the tester chamber or to the tube, is upwardly seating and pressure from the hydrostatic head as the device is removed from the well tends to hold the valve closed upward rather than to push it open?

The Witness: That is correct, sir. There are many successful testers but they are all on that principle of an upwardly seating valve.

Q. By Mr. Mellin: Now, referring to Exhibit 17 before you, which is the book of patents, Mr. O'Neill, will you point out whether or not you find in any of those prior art patents a disclosure of a well testing or sampling device, the lower end of which is closed by a sealing element which is adapted [415] to be opened in a position when a ball is dropped, thereby rupturing it?

A. Yes, sir.

(Testimony of Frank E. O'Neill)

Q. What patents, if any?

A. I find that feature in the McGregor patent. Now, the McGregor patent does not carry a packer, but, as I testified earlier, it was for the purpose of securing materials from subaqueous bottoms.

The Court: The McGregor patent is Exhibit 17-C?

The Witness: Yes, sir, that is correct, 17-C. The same principle is involved in Harris.

Q. By Mr. Mellin: Is that 17-J?

A. That is 17-J, the patent to Harris. The patent to Steele may not quite answer that. The patent to Steele they say has a plug in the bottom of the tubing and they drop a weight in and knock the plug out. It does not say it ruptures it, or that it is frangible. It just says a plug.

The Court: Are you referring to Exhibit 17-A?

The Witness: 17-H, sir.

Q. By Mr. Mellin: Are those all of them, Mr. O'Neill?

A. I believe that is all that will so open.

Q. Now, will you state whether or not you find in the prior art patents of well testers and samplers the disclosure of the use of a ball valve, which is dropped down the tubing after the fluid has entered the tubing to seat downwardly, to [416] prevent the escape of fluid downwardly out of the tubing?

A. Well, the patent identified as 17-J to Harris has that feature.

Q. And that is the ball valve 23, which is dropped downwardly after the fluid has entered?

A. And seats in the tapered member 13.

(Testimony of Frank E. O'Neill)

Q. 13?

A. Yes. The patent to Macready, there is one there. 17-W is the identification number I have on it.

Q. Is that in Figure 15, the ball valve 33?

A. In Figure 15, the ball valve 33, that is correct, sir.

Q. Now, will you state whether or not you find in the prior art of well testers a disclosure of a well testing or sampling tool having a packer to divide the well bore into upper and lower zones and preventing communication between said zones?

A. That is disclosed in practically all the patents that we have cited which are well testers, with the exception of McGregor. McGregor didn't show a packer. But the entire group of well testers do.

Q. Do you find in the prior art and disclosure of the well-testing tools a well tester or sampler tool having two spaced packers to pack off a zone in the well bore from above and below the packer? [417]

A. That is found in the patent of Burr and Wakelee, 17-A, for identification. It is now shown in the patent to Steele, Exhibit 17-H, but described in the patent, as I recall, where he says, "I will include as many packers and as many of section 7 and 8 as may be necessary to shut off the strata to be tested from other strata." I would assume he would use two, if he wanted to.

The patent to Erwin, 17-I, shows the strata packer idea, two packers above and two below the zone to be tested.

Q. Is that all, Mr. O'Neill?

A. Well, I believe so, sir.

The Court: We will take the afternoon recess at this time.

(Testimony of Frank E. O'Neill)

(A short recess was taken.)

Q. By Mr. Mellin: Mr. O'Neill, before the recess you stated that upwardly seating valves were the type, as I understood your testimony, the only type that would effect an entrapment and would prevent the fluid under the influence of the hydrostatic head entering the tubing and the tester. A. I so testified.

Q. Are there other types of valves?

A. Yes, sir. I was thinking at the moment as between downwardly and upwardly seating valves. There are rotary valves which have operated successfully, and there are slip valves which have operated successfully. [418]

Q. In other words, the valves which will operate successfully, as I understand it, are those which cannot be opened by the influence of the hydrostatic pressure?

A. That is correct, sir.

Mr. Mellin: Now, if your Honor please, on the point of ball valves we have brought into court a device for demonstrating the fact that the ball valve, such as in the Lane device, will not maintain its seat when there is a differential in pressure between the exterior of the tool and the interior of the tool. Now, if the court thinks it would be of any aid to the court in demonstrating the fact, we will demonstrate it with the tool. Otherwise, we will not. If it will be of any help to the court, we will be glad to make the demonstration.

The Court: Well, my understanding of the physical factors involved would be this, that unless the pressure inside of the tube, which is the tester, plus the weight of the ball is greater than the outside pressure of the hydrostatic head seeking to enter through the aperture covered

(Testimony of Frank E. O'Neill)

by the ball, the fluid from the outside would be admitted. Now, I may in error on that, but that is my understanding, and I am telling you both so you can correct me if I am in error.

Q. By Mr. Mellin: Mr. O'Neill, do you have with you a device for demonstrating the fact that when the pressure primarily of the tubing that has a downwardly seating ball [419] valve at its lower end is greater, the pressure on the interior of the tube, than the outside hydrostatic head, that the fluid will enter through the ball valve? A. Yes, I have.

Q. Is that the device here? A. Yes.

The Court: It would not help me, Mr. Mellin, in my understanding, to have that. If my understanding is in error, I would like to have it demonstrated.

Mr. Mellin: Well, your understanding is not in error.

The Court: I thought it was all as simple as the saying that water seeks its own level. Does the defendant dispute that?

Mr. Foster: I think not, your Honor.

The Court: Am I in error on that?

Mr. Foster: I think not.

Mr. Mellin: And may I withdraw those questions from the record, I mean the question relative to the device, and I will not offer to demonstrate it.

The Court: Very well.

Q. By Mr. Mellin: Now, Mr. O'Neill, as I understood your description of the operation of the Lane tool, the packer, after the tool is lowered into the hole, the packer must be first set and then the gun must be fired, and immediately that the last bullet, the top bullet, pene-

(Testimony of Frank E. O'Neill)

rates the [420] sealing tube 4, the tool is opened for the entry of the sample into the tool; is that correct?

A. That is correct, where the single chambered gun is used.

Q. I mean when this bullet, this last bullet has ruptured—the sealing tube has been ruptured by the bullet, when the tool is opened to receive the sample?

A. That is correct, sir.

Q. And after a sufficient time has elapsed to enable the test fluid to enter the tool, the ball valve 28 is dropped to seat on seat 1b, and the packer is released and the tool withdrawn from the hole?

A. That is correct.

Q. Now, in the Johnston tester tool that is used today, and the one which you operated from 1933 to 1938,—well, let's strike that.

In the Johnston tool today, when it is run with a tester assembled on its bottom, is it necessary to first seat the packer before the perforator gun is operated or not?

A. May I have the question read back, please?

(The question was read.)

Q. I beg your pardon. I have the tester and gun backwards.

In the Johnston tester tool with the perforator gun suspended or assembled on the lower end of it, and it is run in [421] for the operation, is it first necessary to seat the packer before firing the gun? A. No.

Q. And in the Johnston tester is the tester opened immediately that the gun is fired? A. No.

The Court: It would not be necessary to seat the packer in the operation of the Lane apparatus except prior to the firing of the last charge; isn't that correct?

The Witness: That is correct, sir.

(Testimony of Frank E. O'Neill)

Q. Now, will you turn to Exhibit 1 and turn to claim

7. A. Yes, sir.

Q. You have read those claims? A. Yes, sir.

Q. Now, I read you from claim 7:

"In combination; a packer adapted when set to divide a well casing into upper and lower zones."

Will you please state what that describes to you as an expert in the art with reference to the physical or operable characteristics of that packer?

Mr. Foster: Just a moment. I object, your Honor, upon the ground that the question is now calling for a construction and interpretation of the patent claims, which is the exclusive province of the court. [422]

Mr. Mellin: If your Honor please, the legal interpretation of the claims and legal scope of the claims is the province of the court. The question of what the elements of the claims were originally directed to those skilled in the art, to define the metes and bounds of the invention,—in other words, in compliance with the statute they are required to concisely state just what device is covered that is within the scope of the patent.

Now, under statute 4888 Revised Statutes it is required that those claims be so specific that they specifically tell one skilled in the art the limits he may go to in the claim.

Now, in the Halliburton case which arose in this court, the Supreme Court said—

The Court: Before you proceed I would like to have the question read.

(The question was read.)

The Court: Objection overruled.

Mr. Foster: I object also on the ground of immateriality, if I am not too late. It is immaterial as to what this language means to this man.

(Testimony of Frank E. O'Neill)

The Court: What is the materiality of it?

Mr. Mellin: The materiality, your Honor, is to show whether or not it accurately and correctly describes the device or machine with the particularity required, which is a question of fact, in that that is directed to one skilled in the [423] art, and to be of aid to the court, to have an expert testify to the fact that it describes only this element, not by any physical or operable characteristics, but solely by its function. That is clearly a question of fact.

In the Halliburton case the Supreme Court said:

“Under these circumstances the broadness, ambiguity, and overhanging threat of the functional claim of Walker become apparent.”

And they go on to state:

“* * * In this age of technological development there may be many other devices beyond our present information or indeed our imagination which will perform that function and yet fit these claims. And unless frightened from the course of experimentation by broad functional claims like these, inventive genius may evolve many more devices to accomplish the same purpose. * * * Yet if Walker's blanket claims be valid, no device to clarify echo waves, now known or hereafter invented, whether the device be an actual equivalent of Walker's ingredient or not, could be used in a combination such as this, during the life of Walker's patent.

“Had Walker accurately described the machine he claims to have invented, he would have had no such broad rights to bar the use of all devices [424] now or hereafter known which could accent waves. For

(Testimony of Frank E. O'Neill)

had he accurately described the resonator together with the Lehr and Wyatt apparatus, and sued for infringement, charging the use of something else in combination to accent the waves, the alleged infringer could have prevailed if the substituted device (1) performed a substantially different function; (2) was not known at the date of Walker's patent as a proper substitute for the resonator; or (3) had been actually invented after the date of the patent."

And, therefore, the claims here were invalid as violating the statute.

Now, the claims are directed to those skilled in the art as to what the device is. It is the function of the court to legally interpret the claims, but what it describes to an expert will be of aid to determine whether or not the designation of a packer, as designated in the claim, means any particular packer of any physical or operable characteristic, or whether it means any type of packer to an expert. [425]

The Court: Perhaps we can save time on claim 7, Exhibit 1. Does the defendant claim it means any particular type of packer or does it mean any packer that will serve the purpose—any packer that will function as a packer?

Mr. Foster: Any packer that will function as a packer for the purposes described in the patent, yes, your Honor.

The Court: There is no invention claimed in the packer itself?

Mr. Foster: No, sir.

(Testimony of Frank E. O'Neill)

The Court: Doesn't that meet the question?

Mr. Mellin: That would as to one element.

The Court: As far as claim 7 is concerned.

Mr. Mellin: Claim 7 goes on, your Honor:

"In combination; a packer adapter when set to divide a well casing into upper and lower zones; and a gun means suspended from said packer in said lower zone; said gun means arranged to drive a projectile through the surrounding well casing."

I should like to, and I think I am entitled to ask the witness whether or not that describes, that description of the gun means describes to him any particular gun means or all gun means capable of accomplishing that function.

The Court: I will sustain the objection upon the ground it is clear to me. It does not describe any partic- [426] ular means. I do not need an expert on that.

Mr. Mellin: All right, your Honor.

Q. By Mr. Mellin: Now, with reference to claim 7, Mr. O'Neill, and directing you attention to Exhibits 22 and 24 in which you have illustrated—you have indicated the manner in which you would connect the Mims gun to the Simmons tester, and referring to those diagrams, I will ask you whether you find in that device which you have assembled together, a packer adapted when set to divide a well casing into upper and lower zones.

Mr. Foster: I object to that, your Honor. It is purely a question of law. It calls for a legal conclusion. It

(Testimony of Frank E. O'Neill)

inquires into a subject which is the exclusive province of the court in that it asks this witness whether the claim is infringed.

The Court: Any packer that functions as a packer is intended and will divide a well into upper and lower zones. That is the upper zone above the packer and the lower zone below the packer, wouldn't it?

Mr. Mellin: That is correct, exactly our contention, your Honor.

The Court: I do not need an expert to tell me that unless you think his answer should be in the record.

Mr. Mellin: I will withdraw the question, your Honor. [427]

The Court: By upper zone you mean the zone above the packer and by lower zone you mean the zone below the packer, don't you?

Mr. Mellin: Yes. What I wanted to do, your Honor, was to have this witness supply the elements of these claims to that combination to show the court that in each instance, in both of the patents, all of the elements of each of the claims is found when you tie a gun or screw a gun onto a tester.

The Court: It seems to me that would be the ultimate issue for the court to determine and not for an expert witness to supply.

Now, he can explain what these various claims mean to him as an expert or mean as an expert in the art, if there is anything needing explanation, but as far as claim 7 is concerned I do not need any help on that.

(Testimony of Frank E. O'Neill)

Mr. Mellin: All right, your Honor, because all the claims are almost precisely like that except stated in different language. [428]

* * * * *

Mr. Mellin: Before we commence, your Honor, may I again ask through the court, Mr. Foster whether or not he has the information as to the ownership by the defendant of the Mims patent?

Mr. Foster: We will have the data by two o'clock on that. I can state again, your Honor, the defendant did own the Mims patent at one time, I am sure.

Mr. Mellin: That is, some period from the expiration prior to that period?

Mr. Foster: Prior to that period and I will so stipulate, but I will get some specific dates. I think we had an exclusive license under it for a period of time and then I [447] believe we owned it but I will stipulate that we had either an exclusive license or title under the Mims patent, to which he refers, for a period of years prior to the expiration.

Mr. Mellin: And up to the date of its expiration?

Mr. Foster: And up to the date of its expiration, yes. [448]

* * * * *

Q. Now, Mr. O'Neill, in your experience in testing wells with the Johnston tester what was the range of the rise of fluid in the tubing during such tests?

(Testimony of Frank E. O'Neill)

A. The range of rise in the tubing would be—we always get a little fluid. That is due to the squeeze of the packer down in setting it so when the valve is open a little will come in, maybe only two feet and then it may be anything from there on up to the surface, depending on the source of the fluid and the pressure on the fluid.

Q. Now, in your experience is the rising of the fluid in the tubing through the tester to where the tubing is approximately full of fluid, a frequent or an infrequent occurrence in making such tests with the Johnston tester?

A. I would say it was an infrequent occurrence. It does occur, but infrequently where it rises to the full height [451] of the tubing.

Q. And usually when that occurs it is a matter of flowing through, through the tester—the pressure is sufficient to cause it to flow in?

A. Well, it is a matter of pressure, sir. If it is going to flow it would be termed a flowing condition that would flow over the top of the tubing and then on out.

Q. Now, when the tubing is substantially full of fluid, that is formation fluid, and the well bore and the tube surrounding it and the tool is substantially full of ordinary drilling mud or mud fluid, does the column of the formation fluid in the tubing balance the column of the mud surrounding the tubing?

A. No. The formation fluid would be of lesser specific gravity than the ordinary mud fluid.

(Testimony of Frank E. O'Neill)

Q. So that if the packer were to be released at that time and the mud fluid had access to the lower end of the tubing it would push up whatever was in the tubing until it would overflow the top of the tubing, is that so, until that weight was balanced?

A. At least until it was balanced.

* * * * *

Cross-Examination

By Mr. Foster: [452]

* * * * *

Q. In your opinion it is fairly practical to operate the gun perforator after setting the packer, for example, in the apparatus illustrated in the Spencer patent, Plaintiff's Exhibit 2?

A. Well, so far as to whether it is set first or after,—the packer is set before you shoot, or whether you shoot before you set the packer, in seating a hook wall packer in the casing, I can't see it matters what tool it is on. [508]

* * * * *

The Court: I can take judicial notice of that, Mr. Foster. If you drop an object down a hole or pipe it will fall faster than an object will through a liquid. Are you about finished? [566]

* * * * *

CECIL L. BARTON,

called as a witness by plaintiff, being first sworn, was examined and testified as follows:

* * * * *

Direct Examination

By Mr. Mellin:

Q. Will you give your name, age, and residence, Mr. Barton?

A. Cecil L. Barton; 48; residence, 1635 Broadview Drive, Glendale, California.

Q. Have you any interest whatsoever in the outcome of this litigation? A. I have none.

Q. And are you by education and training a petroleum engineer? A. I am.

Q. And what has been your formal education in that regard, Mr. Barton?

A. I have a degree, a Bachelor of Science Degree, from the University of California at Berkeley.

Q. And what has been your practical experience as a [595] petroleum engineer, say, the last 16 years?

A. I have been employed by the State of California in the Division of Oil and Gas for the last 19 years.

Q. And what is your capacity, sir?

A. Senior Oil and Gas Engineer.

Q. And have you had any experience in connection with the formation testing of oil wells?

A. I have.

Q. And will you briefly tell us something of that experience and how you acquired it?

A. The Division of Oil and Gas requires that tests of water shutoffs be made on all strings of casing set over oil zones, and on the tests of those water shutoffs

(Testimony of Cecil L. Barton)

the Division requires that a representative of the Division be present.

Q. And you have been so present?

A. I have been present.

Q. Approximately how many times in such tests?

A. It would be impossible to say accurately. I would say that it would be in the hundreds.

Q. And is it a requirement of the Oil and Gas Division that the water shutoff at the shoe be practically a certainty before the operator is allowed to proceed?

A. It is.

Q. And that means that there must be an absence of [596] any water leaks at that point? A. Yes.

Q. Will you state whether or not you are familiar with the operation of formation testers of the type known as the Johnston Formation Tester? A. I am.

Q. And I am speaking now of the Johnston Formation Tester independently of any perforating guns.

A. Yes.

Q. And over what period of time, if you recall, have you been so familiar with such tools?

A. I have been familiar with the tool ever since they started operating in California. I could not give you the exact date.

Q. Have you witnessed or observed the samples taken by such tools during these tests, after these tests that you have witnessed? A. Yes.

Q. And by observing those samples you determine whether or not, in your opinion, the water shutoff has or has not been effected; isn't that so?

A. That is right.

(Testimony of Cecil L. Barton)

Q. In your experience have you witnessed any casing water shutoff tests made with such testing tools as I am talking about, the Johnston type, which showed by the sample [597] obtained to you that an effective water shutoff had been made, which test later proved erroneous?

A. Not that I can recall.

Q. In your experience and in these tests that you have witnessed have you witnessed any casing water shutoff tests made with testing tools of the type which we have been discussing which showed by the sample obtained that the cement job leaked, that is, that there was a leak in the casing and that no effective water shutoff had been made, which test later proved erroneous?

A. No; because we require that those wells be repaired in those cases.

Q. Have you witnessed tests made with the Johnston tester with a gun perforator connected to its lower end?

A. I believe that I have when it first came out up in the San Joaquin Valley. If I have, I think it has not been on more than one or two.

Q. Speaking of a Johnston tester without the gun, Mr. Barton, and assuming that in a tool of that character no means is provided to exclude the well fluid from entering the tool following the same path that the sample entered in the tool, so that the fluid in the tool and in its tubing always equalized with the mud fluid in the well, in your opinion would or would not such a tool be of any practical benefit in testing a well for water shutoff? [598]

* * * * *

(Testimony of Cecil L. Barton)

The Court: Isn't it accurate to say that the plaintiff's contention with respect to infringement is that if the invention is as broad as the inventor claims it to be, the plaintiff infringes it?

Mr. Mellin: And if the claims are valid and if the claims are applied literally, yes, your Honor; I think it is [605] fair to say.

The Court: Well, that is the breadth of the inventor's claims, isn't it?

Mr. Mellin: And if the claims are valid. [606]

* * * * *

The Witness: My answer to that would have to be no.

Q. By Mr. Mellin: And would you state your reasons for your answer, Mr. Barton?

A. Well, in testing a water shutoff on a string of casing that has been cemented in the well, it is necessary to obtain a sample of fluid which comes into the drill pipe or tubing during the time the valve is open, and which is below the point at which the packer is set. If the fluid behind the drill pipe or tubing were allowed to be equalized after the packed was released, it would be impossible to identify the character of the fluid which entered during the time the valve was open.

Q. Have you finished your answer, Mr. Barton?

A. Yes.

Q. Now, in making a water shutoff test by a tester of the type of the Johnston formation tester, assuming that the packer is tight and set and the tool is open to take a sample, and thereafter the packer is released and the mud fluid in the well under the hydrostatic head has free

(Testimony of Cecil L. Barton)

access to flow into the tool following the taking of the test sample, and the fluid in the tool equalized with the mud fluid in the well bore, in your opinion would or would not such a test be of any practical benefit in determining whether or not a water [614] shutoff had or had not been effected? A. No. [615]

* * * * * * * *

Redirect Examination

By Mr. Mellin:

Q. Mr. Barton, speaking of the flowing well, it is known that it is going to flow before anything is run into the well, how long has it been the practice to flow a well in through an ordinary tubing with a packer below?

A. I don't know. It is usual—under those conditions they sometimes complete a well after casing has been set; a well is sometimes completed by running tubing on a packer, seating the packer.

Q. And in that instance they are anticipating the flowing well? A. That's right, yes.

Q. Now, to your knowledge, how long has it been the practice to test for water shutoffs by bailing?

A. Well, that would be practiced years ago. In recent years I don't believe that we have one test of water shutoff by bailing out, of, oh, 500 possibly.

Q. Now, is it a fact or is it not a fact that what we [636] call formation testers today were the things that supplanted the bailing tests? A. That's right.

Q. In other words, the bailing practice of testing is the antiquated method of doing it?

A. That's correct.

(Testimony of Cecil L. Barton)

Mr. Foster: That is objected to, your Honor, as suggestive and leading, and is argumentative, and I move it be stricken.

The Court: He has answered. It is his opinion as an expert. Overruled. Motion denied.

Q. By Mr. Mellin: Now, in connection with the tool that Mr. Foster was asking about, and that is the tool in which if you break the packer the hydrostatic head can come up into the bottom of the tool following the sample,—with a tool of that sort could you ever determine, in your opinion, whether a water shutoff had been effected?

A. I don't believe so. Normally, no.

Q. You could tell if it had not been effected?

A. You could tell if it had not been effected.

Q. But you could not tell if it had been effected?

A. Normally, no. [637]

* * * * *

Recross Examination

Q. By Mr. Foster: You stated you believed you had on one occasion observed the operation of the combination Johnston perforator and formation tester. Does the operation of [643] that combined tool have any advantage to your mind over the operation of a gun perforator separately being run in on a cable and withdrawn, and then a formation tester being run in separately and withdrawn?

A. Not as far as we are concerned.

Mr. Foster: That is all.

(Testimony of Cecil L. Barton)

Redirect Examination

By Mr. Mellin:

Q. As a matter of fact, Mr. Barton, isn't it so that even today, and to your knowledge, testers are still being run without the—being run in directly attached to a gun? [644]

Mr. Foster: Objected to.

The Court: Sustained. Reframe it.

Q. By Mr. Mellin: Mr. Barton, will you state whether or not, if you know, testers are run today without being run as connected with a perforator?

A. They are; yes.

Q. And as far as your information is concerned, in what proportion would you say that testers are run without being connected with a gun to those that are run connected with a gun, if you know?

A. I don't know what proportion.

Mr. Mellin: That is all.

Mr. Foster: One question.

Q. You could get an effective test telling that you had water shutoff and the water shutoff had been effected, by a bailing operation with this tool I have described, which permits the annulus of mud to enter the tubing behind the sample after the packer is broken, provided you performed the bailing before the packer were unseated?

A. Yes. That would be the same operation as tubing set on a packer.

(Testimony of Cecil L. Barton)

Q. By Mr. Mellin: In other words, you could accomplish by running a straight tubing down and set a packer around the tubing and then bail for the test, could you? [645]

A. That is right. It would be the same type of test.

* * * * *

Mr. Mellin: At this time, your Honor, I would like to read into the evidence the testimony of—I might tell the court that it was stipulated between counsel for the parties that if Mr. Wilfred G. Lane were called as a witness on behalf of the plaintiff, he would testify as follows:

“Q. Will you give your name, age and residence, Mr. Lane?

“A. W. G. Lane, 62 today; this is my birthday: residence 1554 Hill Drive, Los Angeles 41.”

Mr. Mellin: Through the court, may I tell the reporter that I will give him this document and he does not have to be concerned if I go too rapidly.

The Court: No objection to the reading of it?

Mr. Foster: No objection, your Honor. I just notice something here. May I address Mr. Mellin through the court? This deposition was taken sometime ago. I am not willing to stipulate that Mr. Lane, if called today, would say today was his birthday. As the date of the deposition, it was his birthday.

Mr. Mellin: As far as I am concerned, your Honor, that [646] can go out.

"Q. What is your occupation?

"A. Retired. I am the busiest retired man you ever saw in your life.

"Q. What was your occupation before you retired?

"A. Lane-Wells Company.

"Q. In what capacity?

"A. Operating vice-president.

"Q. Do you have any interest in the Lane-Wells Company?

"A. Yes, a stock interest only.

"Q. You are the W. G. Lane who is named as patentee in the patent in suit here, No. 2,029,491, patented February 4, 1936, a copy of which I hand you?

"A. That's right.

"Q. And at the time you applied for that patent, Mr. Lane, you believed, of course, that you had made a patentable invention, did you not?

"A. Yes.

"Q. And you are still of that opinion?

"A. I have had no reason to change my mind.

"Q. Do you feel that the validity of that patent should be sustained?

"A. I can best answer that the same way. I know of no reason why it shouldn't. [647]

"Q. This application was filed, Mr. Lane, on August 25, 1934, but it was a continuation in part of a prior application filed December 20, 1932.

(Deposition of Wilfred G. Lane)

What, if any, experience had you had in formation testing prior to December 20, 1932?

"A. Let me ask you this question: When you say what experience had I had, do you mean actual experience of my own?

"Q. I think that would be so, yes.

"A. None of my own.

"Q. What, if anything, was Lane-Wells doing, say, just prior to December 20, 1932, in connection with perforating guns, as you knew them?

"A. We were developing it.

"Q. Were you commercializing it?

"A. No, because we hadn't got that sufficiently developed by December, 1932, for commercial exploitation.

"Q. Do you recall when you did have it so sufficiently developed, approximately?

"A. I think my recollection is—and again it is a matter of statistical record, which you can easily check—that the first well that we ever run a test gun into was in December of 1932, down on the Dominguez lease of the Union Oil Company. [648]

"Q. Was that gun run in in connection with a formation tester, or just run in on cable by itself?

"A. The gun only.

"Q. The gun only?

"A. Yes.

"Q. Do you recall any circumstances that gave rise to your inventing this combined gun type formation tester that is shown in this patent which I have shown to you?

"A. At the time that the gun itself was being developed, and after I had demonstrated to a bunch

(Deposition of Wilfred G. Lane)

of oil men that electrical control at the top of the hole was safe and feasible, it was the thought down at Lane-Wells that we ought to tie up—you know what I mean by that, in patent terms—every possible application that the gun might have, every application that it might have and every means by which it might be operated.

“Q. In other words, you mean by ‘tie up’, to make a monopoly by means of patents?

“A. Well, I don’t like the word ‘monopoly’, but, for the want of a better word, yes.

“Q. In other words, to try to cover it by patent?

“A. Yes, to protect ourselves as completely as possible. [649]

“Q. And so that gave rise to this invention that is disclosed in the Lane patent that you have been referring to?

“A. That is right.

“Q. And this thought of combining the gun and the formation tester was an original idea with you, or was that an end to work toward, from an engineering standpoint?

“A. It was an original idea with me, to this extent, that, being a trained engineer, I couldn’t see any sense in so much back motion, so much lost motion; I couldn’t see anything to be gained by running a perforator in and coming out of the hole, and running a tester afterwards, and the thought occurred to me, why not do them both at once. It was the reasonable thing to do.

(Deposition of Wilfred G. Lane)

"Q. And, as a trained engineer, that advantage over prior methods was before you?

"A. Yes. I am a graduate electrical-mechanical engineer, and in 1936, I got my Master of Engineering degree.

"Q. Did any one work with you on the design of the dual device shown in this patent that we have been discussing?

"A. As far as the design and development was [650] concerned, probably everybody in the organization had a hand in it. We were all coordinated together down there.

"Q. Your contribution, however, was the bare thought of combining the gun and the formation tester in one tool?

"A. Yes—the sketching out of the way in which the gun could be operated without the use of the electric cable on which the perforating gun had, up until that time, been run.

"Q. To your knowledge, Mr. Lane, was a combined tester and gun ever produced by the Lane-Wells Company?

"A. I left Lane-Wells in 1938.

"Q. I am talking about to your knowledge.

"A. I was going to say, to my own personal knowledge, I don't know.

"Q. Was any combination gun and formation tester made by Lane-Wells during the time you were closely associated with them, prior to your termination?

"A. Again I will have to say this: We had a research department down there. We also had this Technicraft Engineering Corporation down

(Deposition of Wilfred G. Lane)

there, which was more or less in charge of our research department, and they would take ideas that Tom, Dick [651] or Harry might suggest at our round table meetings and take them over and try them out in a sort of embryonic way, and that may have been done without me knowing it.

"Q. To your knowledge?

"A. To my knowledge, no, sir.

"Q. To your knowledge, no combined tester and gun was ever used commercially?

"A. Not to my knowledge, no." [652]

* * * * *

Now, if your Honor please, I have a very short deposition to read into the record, that part of the record of the testimony of Mr. Rodney S. Durkee.

The Court: How do you spell that last name?

Mr. Mellin: D-u-r-k-e-e-. [655]

* * * * *

"Q. Give your name, age and residence, Mr. Durkee.

"A. My name is Rodney S. Durkee; 59; 597 San Marino Avenue, San Marino, California.

"Q. What is your occupation?

"A. President, Lane-Wells Company.

"Q. That is the defendant here?

"A. Yes.

"Q. How long have you been associated with the Lane-Wells Company in that capacity?

"A. I have been president since 1939. Prior to that time I was one year with the company. [658]

(Deposition of Rodney S. Durkee)

"Q. Is it part of Lane-Wells' business to render service of gun perforating wells?

"A. Yes.

"Q. And that service has been offered by Lane-Wells all during the time you have been associated with them?

"A. Yes.

"Q. And would you say that that was the major part of Lane-Wells' business or not?

"A. Yes, a substantial part."

Page 24.

"Q. The Lane-Wells Company does not sell perforating guns, as I understand. They render service in which the guns are used?

"A. That is correct."

Then skipping to line 10, Mr. Foster.

"Q. Does the Lane-Wells Company manufacture, sell or use or rent a formation tester service?

"A. No.

"Q. Have they done so at any time while you have been connected with them?

"A. No."

Skipping to page 28:

"Q. During the time you have been associated with the Lane-Wells Company, has the Lane-Wells Company [659] made any devices for formation testing?

"A. We have not manufactured any and put them into commercial use. We have been experimenting with and constructing structures of various kinds over a period of years.

(Deposition of Rodney S. Durkee)

"Q. Are those testers combined with a gun, or just simply testers?

"A. As far as I know, all of them are looking toward the combination of the tester and the gun.

"Q. As far as commercial use it concerned, the Lane-Wells Company, during the period you have been with them, have not commercially put out, for use, any combined formation tester and perforating gun?

"A. That is correct.

"Q. Or any formation tester by itself?

"A. That is right.

"Q. How long, would you say, approximately, has this experimenting with testers been going on?

"A. Well, to my knowledge, ever since I have been with the company. How long before that I don't know—1938.

"Q. It has been continuously during the time you have been there?

"A. Yes, with the exception of the interruption caused by the load on our engineering department [660] during the war."

* * * * *

Mr. Foster: May I reserve the right, your Honor, after I have read the entire deposition to offer additional portions, or to require Mr. Mellin to do so, in accordance with the Rule? [661]

* * * * *

Mr. Foster: May the record, your Honor, which Mr. Mellin has read or the excerpts he has read into the record, may the record show adjacent to that that this deposition was taken February 18, 1947, because Mr.

Lane would testify differently now and to the effect that the Lane-Wells Company had built a successful operative combined gun perforator and formation tester at this date? [662]

* * * * *

Mr. Mellin: May I respectfully read into the record part of the deposition of Walter T. Wells, who is the chairman of the Board of the Lane-Wells Company? [663]

* * * * *

"Q. Give your full name and residence.

"A. Walter Todd Wells, 5222 North Vista La Jana Lane, La Canada.

"Q. What is your occupation, Mr. Wells?

"A. Chairman of the Board, Lane-Wells Company,

"Q. That is the defendant-counter-claimant here?

"A. Yes, sir.

"Q. How long have you been associated with the Lane-Wells Company?

"A. Since it was founded, in 1932."

And I skip to page 7, line 2.

"Q. When did the Lane-Wells Company go into the business of casing gun perforators?"

Mr. Foster: That is objected to as immaterial.

The Court: Overruled.

Mr. Mellin:

"A. To perforate our first commercial well, in January, 1933.

(Deposition of Walter T. Wells)

"Q. Where was that—here in California?

"A. It was at Santa Fe Springs.

"Q. And the Lane-Wells Company have been in that business of making and operating casing gun perforators ever since, haven't they? [664]

"A. That's right."

And at line 26:

"Q. At that time was anyone else perforating by the use of gun perforators in California fields, to your knowledge?"

Mr. Foster: Objected to as immaterial.

The Court: Overruled.

Mr. Mellin:

"Q. At that time—let's make it the first part of 1932.

"A. No, I don't think so."

Skipping to the top of page 10.

"Q. I hand you patent No. 2,029,491, in suit, and ask you if you are generally familiar with the device there disclosed?

"A. Yes, generally. I haven't seen the patent itself in years.

"Q. That patent is directed to what is alleged in there to be a combined gun perforator and formation tester?

"A. It is called a gun type formation tester, yes.

"Q. Can you tell us whether or not the Lane-Wells Company, or anyone else on behalf of the Lane-Wells Company, ever built a structure such as shown in that patent? [665]

"A. I wouldn't know.

(Deposition of Walter T. Wells)

"Q. To your own knowledge, no such have been built?

"A. I have never seen one.

"Q. Had one been built in the Lane-Wells Company plant, you would have known it, wouldn't you?

"A. No. We build a lot of things down there that I don't know about.

"Q. But as far as you know, they have never built one as shown in this patent?

"A. No.

"Q. To your knowledge, has the Lane-Wells Company, or anyone in your behalf, built a tool in which a gun perforator and tester were combined in one tool?

"A. We have been working on a tool like that for an extended period of years, but how many models or specimen devices have been built, I don't know.

"Q. You never built one commercially and used it commercially?

"A. We have never offered it to the oil service as yet." [666]

* * * * *

"Q. I notice the patents were originally issued to [667] the Technigraph Engineering Corporation. Was that a corporation wholly owned by the Lane-Wells Company?

"A. Yes, sir.

"Q. And the inventor mentioned as inventor in patent No. 2,029,491, he was one of the majority stockholders in the Lane-Wells Company, was he not?

"A. He owned a 50 per cent interest at that time.

(Deposition of Walter T. Wells)

"Q. I beg your pardon. And Mr. Lloyd Spencer at that time, on May 1, 1935, was an employee of the Lane-Wells Company?

"A. That's right."

Skipping to line 17 on page 18:

"Q. From your knowledge of the oil field business, Mr. Wells, has there been any need in the oil fields for a combined gun and tester during the period, say, commencing in 1932, to the present time?

"A. I don't know what the oil fields need.

"Q. As far as you know, there wasn't any such need?

"A. Well, I am not close enough to the oil operators to know what they actually need.

"Q. If there was such a need, you would know of it?

"A. I probably would have heard of it."

Page 19, line 17:

"Q. I guess the answer is, then, that, as far as you know, there has been no need in the oil [668] fields of California for a combined perforating gun and tester?

"A. Well, I felt that a tool of that type that was properly designed and engineered, that would save time and be safer for the company to operate, would be of commercial advantage.

"Q. But the separate running of the gun perforator and then the subsequent running of the tester satisfactorily handled the problem up to now, as far as you are concerned?

"A. Well, they have gotten along, I think, with those devices."

Mr. Foster: May I have a similar reservation that I had with respect to the Durkee deposition? [669]

* * * * *

JAN LAW,

called as a witness by defendant, being first sworn, was examined and testified as follows:

* * * * *

Direct Examination

By Mr. Foster: [713]

* * * * *

The Witness: I have poured into the graduate cylinder a quantity of fresh water, approximately 235 cubic centimeters. Into the graduate cylinder I have put a piece of bentonitic material. The reading on the graduate is now 265 ccs., the difference representing the volume of rock material placed in the graduate.

Mr. Mellin: May I have the record show, your Honor, or have by the witness, that the material he placed in the glass is free from water when he put it in?

The Witness: Free from water. Any exposure to atmosphere, there is water-vapor in the atmosphere. To answer your question with a "yes," sir, would require that this had been kilned or dried in an oven, and that is not the case.

Mr. Mellin: Except for kiln-drying, it has not been previously submerged or subjected to contact with fresh water?

The Witness: Not since it came into my possession from [754] the Bariod Sales Division of National Lead Company. [755]

* * * * *

(Testimony of Jan Law)

A. I have a publication, the Bulletin of the Agricultural and Mechanical College of Texas, issued September 1, 1944. It is a bibliography on the Petroleum Industry, edited by E. DeGolyer and by Harold Vance. In this bulletin, which is strictly a bibliography, they have certain titles: The discussion of drilling fluids in general. They refer to 44 articles appearing in magazines and transactions of A. P. I., A. I. M. E. and others.

Under the title "Property of Drilling Fluids and Methods of Determining them," they have 45 articles.

"Drilling Problems Related to Mud Control," 39 articles.

"Filtration Characteristics of Drilling Muds," the first entry is 1932 in this bibliography, the last entry is 1941; there are 22 articles referring to filtration characteristics of drilling mud.

On "Viscosity-Gel Properties of Drilling Mud," they have 23 items.

"Chemical Treatment and Gel Enrichment," 14 items.

"Salt Water Muds," three articles.

"Ingredients of Drilling Fluids," 18.

"Mud Fluid Reconditioning Devices and Methods," 19.

And conversely, for methods of removing mud, mud cake, in an attempt to alleviate the damage caused by mud, they [793] have under a title "Cleaning and Preparing Wells; Well Conditions Affecting Yield," they have 26. All 26 are not necessarily concerned with removal of mud alone; some of them refer to paraffine and sand.

* * * * *

A. One more item: "Clean Out Methods and Results in Particular Fields and Areas." That, also, would not

(Testimony of Jan Law)

necessarily be the—the 24 articles would not necessarily treat exclusively with mud, but would be concerned with other materials that needed to be cleaned out.

Mr. Foster: The publication, the print of the title sheet of the publication and those pages of the publication listing the articles by title, to which the witness has referred in his last answer, is offered into evidence as Defendant's Exhibit 1. [794]

The Court: Is there objection? Is there objection?

Mr. Mellin: No, your Honor.

The Court: Received into evidence.

Q. By Mr. Foster: Are you aware, Mr. Law, of any measures which have been taken in the past to avoid the damage done to sands by reason of fresh water invasion or to reduce that damage?

A. Yes. One of the earliest, one of the most common, is to treat the mud to what I have stated earlier is the difference between a good mud and a poor mud, the addition of admixtures to the mud such as to reduce the filtration, therefore, reduce the amount of mud cake formed; and also to treat that mud for the purpose of producing a mud cake which is the easiest to remove.

The Court: Is the best mud the one that has the least degree of filtration or lowest rate of filtration?

The Witness: Yes, your Honor.

The Court: In other words, the best mud is the mud that will hold its water, is that it?

The Witness: Yes, your Honor. Concurrent with holding the water it follows that the mud cake will be the thinnest; it will perform both operations of producing a thin mud cake and producing a small amount of infiltration.

(Testimony of Jan Law)

Then other measures are to depart from fresh water drilling muds and use, for instance, oil base muds, in [795] which an oil base mud is made up of certain solids and oil in the absence of water. A result is that the filtration which may take place will be oil infiltration rather than fresh water infiltration.

A third measure has been the use in the past of salt water base muds, in which the invading fluid, the infiltrating will be salt water rather than fresh water.

At times, where it is possible, they have used as a drilling fluid oil alone to circulate the material and to help perform the drilling operations.

Those are expedients, means of reducing the damage to sands. They perform other functions as well, not limited exclusively to the prevention of damage.

Q. By Mr. Foster: You mentioned a salt water base mud, and earlier in your testimony you referred to the deflocculating property of salt in the mud. What is done in those salt water muds which you last referred to, if anything, to prevent that deflocculating effect?

A. One of the well known commercial products is an Empermex put out by Baroid Sales of the National Lead, in which the solids are, for the most part, starch, treated in such a manner as to produce a material which, in the absence of salt water, will not settle out.

Q. Is it more or less expensive to use these muds you have described, instead of the water base mud in oil field operations? [796]

A. In general, the cost of the mud itself per unit volume is greater for an oil base mud as compared to a fresh water base mud.

(Testimony of Jan Law)

Q. Is that true also of the other muds, the salt water base mud and chemically treated mud?

A. Well, a chemical treatment is an additive to a natural clay and water. It is an expense item over an untreated mud. The salt water starch is more expensive than is clay and water.

Q. Can you give us an idea of the relative expense, assuming, if you will, a well depth of 7,000 feet with 8-5/8 inch casing and one change of the drilling fluid during the drilling operations? Can you give us an approximation of the cost of the oil base muds?

A. The oil base mud sells for approximately \$8.50 a barrel. A simple clay in water suspension mixture, which would not be used on a 7,000 foot well by a prudent operator, he would make certain additives to it, so that I would estimate the cost of the clay and the additives to produce a reasonably good quality of mud that it would cost about from \$1.25 to \$1.75 a barrel, as opposed to the \$8.50.

Now, the volume in 8-5/8 inch casing at 7,000 feet, if my memory is right, I believe that one barrel fills about 25 feet. I can be wrong on that, but the process would be so many barrels times \$8.50, as against so many barrels at, say, [797] \$1.50 or \$1.75.

Q. Are the crews paid the same amount with the operations involving the use of oil base mud as when the operations involve the use of water base mud?

A. The most spectacular case I heard of, of crews receiving more money, was during the war, and because the oil base mud is very damaging to clothes, and very mean and awkward to work around, the crews in the Wilmington Field, and that would be a 24-hour series of

(Testimony of Jan Law)

men, five men to a crew and for three eight-hour shifts, received a bonus of \$35 a day for working with oil base mud. It is my understanding that at the present time the bonus for working with oil base mud as compared to water base mud is about \$11 or \$12 a day.

Q. Is there any greater danger to the crews working with oil base mud than with water base mud?

A. The material is burnable, it is inflammable, being oil base. The exact flash point, and so on, is rather carefully controlled, but it is subject to being burned and subject to catching on fire, as opposed to the perfectly safe fresh water mud. [798]

* * * * *

Cross Examination

By Mr. Mellin:

Q. Mr. Law, you testified, as I recall it, that there would be a difference of approximately eight hours saved in the running-in of a combined tester and perforator and the running-in of a line gun and followed by a tester run in on tubing; is that your testimony?

A. There are two savings of time, and I am attempting to recall. One would be a saving in rig time and the other would be a saving in the time elapsed of exposure of the formation to fluids.

Q. I am speaking now, not on the time in which the formation is exposed to the pressure of the mud fluid. I am speaking solely of the time which you state was saved by running a combined tool rather than two tools individually. To refresh your memory, I will read your testimony on it.

(Testimony of Jan Law)

The Court: As I recall, the witness testified it would be a 12-hour loss of time in putting the two tools into the well to complete that operation.

Q. By Mr. Mellin: How long would it be? [862]
How much would you save and what would be the difference in saving of time—not of the pressure on the formation—but of the running in of the combined tool as compared with the running in of the two tools?

Mr. Foster: That is objected to as indefinite unless the depth of the well be given.

Mr. Mellin: 11,000 feet.

A. It would be the length of time required to rig up the gun perforator on a cable, run it into the hole and remove it from the hole, and remove equipment and rig up necessary for the running of the gun. And at 11,000 feet on an ordinary performance, I imagine that that performance would take some eight hours or so. That time would be saved.

Q. How much would it take for the combined tool, the time to run that in and out? You would not save all of the eight hours, would you, Mr. Law?

A. I limited it in my description to the time necessary for discharge of the gun, saying that that was comparable to both instruments, the time of discharge. Now, the length of time required to run a combination gun to 11,000 feet, is that your question, sir?

Q. I want to know how much time you save, what is the difference in time of perforating and testing by running a gun separately from the tester, and then running the tester, as compared with running a combined gun and tester. [863]

(Testimony of Jan Law)

Mr. Foster: That has been answered. That was precisely the question Mr. Law answered, it would be eight hours, about eight hours.

The Court: Sustained.

Q. By Mr. Mellin: The running of the combined tester and the gun, the time required for that would be comparable to the time in which it would take to rig up and run a tester by itself and pull out; isn't that so?

A. You are speaking now of just running time, running in the hole and pulling out, and not the time incident to the discharge or the time of taking the test, but strictly running time?

Q. All right. Let us take the running time, first.

A. It would be the same whether or not you had a tester alone on the hole or whether you had a gun and tester, with the exception of maybe some rigging up time, depending on how the equipment was delivered at the rig.

Q. In other words, in the combined tester and gun, if anything, there would be a little more rigging up time, wouldn't there?

A. Combined tester and gun?

Q. You would have a little more rigging up time, if anything, it would never be less?

A. Never be less.

Q. And the rigging up time of the tool would be almost [864] comparable, wouldn't it?

A. Well, I have never witnessed the operation on the rig of the running of a combined tool. I don't know how many pieces it is delivered to the rig in.

(Testimony of Jan Law)

Q. Well, you have testified that you would save approximately eight hours by running that in, instead of the two separately. What was that based on?

A. The length of time it requires to run a gun on the cable, discharge it and remove it from the hole, since, if you use a tester alone, you have to run it in the hole. If you use a combination gun, you have to run it in the hole. The difference between running the two is the trip in and out of the hole and expense of rigging up, associated with the gun on a cable.

Q. It is your testimony that it would take eight hours to run a line gun in and out 11,000 feet, fire and pull out?

A. If I have so testified, I have testified in relation to an average job at 11,000 feet.

Mr. Mellin: Will you mark this for identification?

The Clerk: The document will be marked 32 for identification, a one-page document.

Q. By Mr. Mellin: I show you a paper which counsel served on me, entitled "Lane-Wells Company" and "Summary of Perforating and Operating Time on Kings County Oil Co. [865] Von Glahn No. 1", giving a list of wells, and at the bottom it says: "Average Total Job Time for one perforating operation involving one traverse of the well 2 hr. 52 min. at an Average Depth of 10,476" feet. In view of that would you change your testimony from eight hours to two hours and 52 minutes?

A. No, sir.

Q. It is still your opinion, then, that it takes eight hours to run a perforating gun in and out of the hole and the rigging up time to perform it?

A. I have testified as to the average job at 11,000 feet. That includes dummy runs, feeling runs. The 11,000 feet being an unusual depth often requires that the

(Testimony of Jan Law)

gun be run in the hole to establish the stress in the line, the stretch in the line, such that a recording and depth measured at the bottom of the hole and that string can be returned to the surface of the hole and the two checked out at zero.

I am referring to a situation in which a gun perforator truck moves from well to well in the course of its normal business and comes to an average well at 11,000 feet.

Q. Would you say there would be a material difference between a well at 10,476 feet and 11,000?

A. I would not.

Q. They would be comparable, would they not?

A. They would. [866]

* * * * *

The Witness: I think, your Honor, that there are two eight-hour periods under consideration. One eight-hour period could be considered rig time, which is concerned with the lowering of the gun on the cable and the removal; the other eight-hours is considered the time of exposure of the sand to the mud fluids within the well bore. The second eight-hour period is occasioned by the time elapsed following perforation, the removal of the gun from the hole, the assembly of the tester and the lowering of the tester in the hole, the setting of the tester, opening it. That eight-hour period is exposure to mud.

The previous eight-hour period is rig time consumed in running in the gun and removing it.

Does that answer your question? [869]

* * * * *

The Court: I did not understand that he had ever said that there was a saving in every case; but I understood

(Testimony of Jan Law)

him to say it would take eight hours in a normal case to run a gun in on a string or a cable and fire it, perforate the casing, and bring the gun back out and dismantle the rigging. Is that correct?

The Witness: A normal case, at 11,000 feet, with normal equipment and usual operation. [870]

* * * * *

The Court: Do you desire, Mr. Foster, to offer Defendant's Exhibit D for identification, which is a paper written by the witness, as I have a note on it?

Mr. Foster: Yes; I will offer that into evidence.

The Court: Is there objection to it?

Mr. Mellin: No, your Honor.

The Court: Defendant's Exhibit D for identification received into evidence. Defendant's Exhibit E for identification is a rock sample. Do you offer it?

Mr. Foster: I offer that into evidence, your Honor.

The Court: Is there an objection?

Mr. Foster: Is Plaintiff's Exhibit E—that is a piece [872] of rock?

The Court: Well, it is a sample, is it not?

Mr. Foster: Of bentonitic material.

The Court: Of the montmorillonite which you have been speaking about?

Mr. Foster: Yes.

The Court: Received into evidence, Defendant's Exhibit E for identification.

Do you offer Defendant's Exhibit H for identification, which is a government bulletin, I believe?

(Testimony of Jan Law)

Mr. Foster: Yes; I offer that into evidence as Defendant's Exhibit H.

The Court: Received into evidence. Do you desire any data to be shown on this test?

Mr. Foster: Thank you, your Honor. That was my next request. Would you step down, Mr. Law, and describe the swelling, if any has occurred, and give us an approximation or give an indication of the approximate volume of the bentonitic material that you placed in there at 10:15 this morning, in fresh water, note being taken that it is now about 3:30 p. m.?

The Witness: In order to measure the volume it is necessary to make some kind of a visual netting of the amount of material, solids, opaque material within the graduate. There has been a visible swelling of the [873] material, and I imagine that the material could net, that is, by a visual cut and fill process, of something around 75 or so cubic centimeters of material now exists as an opaque, swollen rock.

The Court: As against how many when it was put in this morning?

The Witness: Those figures are available, your Honor.

Mr. Foster: I have them.

The Court: Well, they are in the record.

Mr. Foster: Yes; they are, your Honor.

The Court: Is that material which is in the test tube or in the graduate which you have testified about, is that from the same rock of which a sample is marked here in evidence as Defendant's Exhibit E?

The Witness: From the same rock? It is from the same sack and from the same group of rocks.

The Court: The same type of material?

(Testimony of Jan Law)

Mr. Foster: Yes.

The Witness: Yes, your Honor.

Mr. Foster: That was 30 ccs. this morning, I am told by Mr. Kern, who checked the record.

I thought perhaps your Honor might care to observe particularly the type of this, the manner in which it grows in a flower-like material to indicate swelling. The court will recall that it was more or less a smooth rock, without [874] these sprouting flower-like protuberances on it when it was placed in there, looked like the rock in evidence.

The Court: That is montmorillonite, is it?

Mr. Foster: Yes, your Honor.

The Court: The same thing that has been referred to here today?

Mr. Foster: As present in sand formations producing oil; yes, your Honor.

The Witness: I would prefer, your Honor, to call it a montmorillonite type; and if one can be involved in rock specie, that maybe there is only one montmorillonite rock, and that is located in France. But this is a rock which may be called montmorillonite type, which very closely resembles that rock found in a certain portion of France.

The Court: What do you call it here in America?

The Witness: We call it bentonite, swelling bentonite, or a montmorillonite rock, loosely used. [875]

* * * * *

Mr. Mellin: May it be corrected that way?

Mr. Foster: That is perfectly satisfactory.

The Court: Striking the word "formation" and substituting the words "well bore"?

Mr. Mellin: Or "well."

(Testimony of Jan Law)

The Witness: "Drilling fluid."

Mr. Mellin: "Drilling fluid" would be more satisfactory.

The Court: Drilling fluid. Very well. The word "formation" is stricken and the word "drilling" is substituted.

The Witness: In that case, if it is "drilling fluid" the answer would be "Yes."

Mr. Mellin: That is correct.

Mr. Foster: May I say, your Honor, these are not reporters' mistakes. They are the mistakes of the witness and they are caused by the clumsy manner, I think, in which I framed the questions.

Then there is one question that I asked on page 822 of the record, which I believe might be misleading. In this question I was attempting to recapitulate the testimony of the witness as to the ill effects of the water in the formation impeding the entrance of the formation fluids. In item 4, "diluting or masking the sample," of course, is not a factor of impedence, and the witness did not so testify, that [884] the dilution or masking did impede. I misstated his testimony in framing that question. To be accurate, the clause No. 4 should be omitted.

The Court: Do you desire to strike it from the question?

Mr. Foster: I would prefer to do so, if I might. The answer did not adopt it.

The Court: Is there objection?

Mr. Mellin: I don't see any.

The Court: Then item (4) will be stricken from the first question on page 822 and item (5) will be re-numbered (4). [885]

M. O. JOHNSTON,

called as a witness by the defendants, having been previously duly sworn, was examined and testified as follows:

Direct Examination

The Clerk: You are the Mr. M. O. Johnston who has heretofore been sworn, are you not?

The Witness: Yes, sir.

The Clerk: You were sworn the other day?

The Witness: Yes, sir.

The Clerk: Be seated.

By Mr. Foster:

Q. You are the same Mr. Johnston who was previously sworn and testified, and are the president of the plaintiff company; is that correct? A. Yes, sir.

Q. Your counsel has produced, in accordance with my request, one sheet entitled, "Record of Combined Gun and Tester Runs," which I understand to be the record of all of the runs of your combined tool, which have been performed by the plaintiff company; is that correct?

A. Yes, sir.

Mr. Foster: I offer that in evidence as Defendant's Exhibit P.

The Court: Received in evidence. [1022]

Q. By Mr. Foster: I notice from Exhibit P, Mr. Johnston, that your first runs of the combined tool are in January 1946 to the number of seven, and that the number grew consistently through the 12 months of 1946. Isn't it a fact, Mr. Johnston, that the plaintiff company experienced great sales resistance, great opposition by the industry in attempting to introduce this combined tool into use, and that the plaintiff company succeeded in having this business grow in the manner here reflected only by overcoming that great sales resistance and opposition by

(Testimony of M. O. Johnston)

extensive advertising and sales effort and exploitation and education?

A. Well, there was quite a bit of sales resistance until we could show them that we could shoot and test at the same time.

Q. In other words, this combined tool was such a departure from the tools that had gone before and had been used before, that you had a very substantial opposition to its use to overcome in the industry in order to have this number of uses reflected by Exhibit P?

A. No, we didn't have very much opposition.

Q. Well, isn't it a fact that you spent a great deal of money in advertising to secure these uses?

A. No, sir, not very much.

Q. How much would you say in the two years covered since January, 1946? [1023]

A. Well, I couldn't say, Mr. Foster, because the advertising that was done was by field work, the men talking it. So I really couldn't say how much.

Q. Would you say several thousands of dollars?

A. I imagine so, yes, sir.

Q. When did your first ad appear in any publication with respect to the combined tool?

A. I am not sure of that. I think it was this year.

Q. How many salesmen did you have attempting to persuade the industry to use this combined tool?

A. Oh, that was most everyone that was testing and the men that were in charge of the districts.

Q. Did you have any salesmen who acted only as such in attempting to introduce this combined tool?

A. Yes, we did part time, in Texas.

Q. Did you have any here in California, in this area?

A. Not entirely; not devoted entirely to that.

(Testimony of M. O. Johnston)

Q. In other words, you used the organization you then had to give publicity by word of mouth to the industry with respect to the combined tool?

A. That is correct.

Q. And after you had demonstrated this to any operator in the oil industry, then that sales resistance and opposition was eliminated, and he readily accepted the tool for subsequent use; is that correct? [1024]

A. Yes, sir, that's true.

Q. So that, as regards the California operations in 1946, you were able to have a total of 687 uses of the combined tool, without employing any salesmen or without advertising in any publications to the industry; is that correct?

A. I believe we hired one man that was partly on that in California.

Q. In 1946? A. I think so, yes.

Q. That is to acquaint the industry with the advantages of the combined tool? A. That's correct.

Q. The Texas Company to which you referred is the Johnston Oil Field Service Corporation, the Texas corporation; is that correct? A. Yes, sir.

Q. And they have used a combined gun perforator and tester in all manners identical with the gun perforator and tester, the combined tool, the subject of the suit here; is that correct?

A. Yes, sir.

Q. How many uses of the combined tool has the Texas company had since its first use for hire of the tool?

A. I don't know that.

Q. Would it be a number like or similar to the number [1025] here which you have reported?

A. No, sir, it would not; very low.

(Testimony of M. O. Johnston)

Q. A lesser number?

A. Yes, sir.

Q. One of the objects of the Lane patent is stated to be: to provide a formation tester which fires a projectile or several projectiles through the well casing and thereafter receives the sample through the perforation so made. That was one of your objects in providing the combined tool, the subject of this law suit?

A. Yes, sir.

Q. And that object was accomplished by the combined tool?

A. Yes sir.

Q. Another provision of the Lane patent is stated to be: to provide a gun-type formation tester which may be run in on standard tubing or the like and utilizes other conventional well equipment for its operation. That was one of your objects in providing the combined tool of your company?

A. That was the object of providing the gun.

Q. And that object was accomplished by the combined tool?

A. Yes, sir.

Q. Another object of the Lane patent was: to provide [1026] a formation tester of this class in which the damage to the well casing consists merely in one or more relatively small round perforations that may be readily cemented up if improperly located or otherwise undesirable, thereby providing a formation tester which does not interfere with subsequent drilling or other operations in the well bore. That also was a purpose of your provision, the plaintiff's provision of this combined tool?

A. Yes, sir.

Q. And that purpose was accomplished by them?

A. Yes, sir.

(Testimony of M. O. Johnston)

Q. The object of the Spencer patent is stated to be: to provide a formation testing apparatus wherein a gun mechanism is incorporated with a tester valve structure and a packer and is adapted to be lowered therewith as a unit. That was an object which was accomplished by your provision of plaintiff's combined tool?

A. Yes, sir, that's correct.

Q. Another object of the Spencer patent was: to provide a projectile firing formation tester wherein the formation tester valve may be controlled from the surface independently of the operation of the gun. That was the object of the plaintiff and an accomplished object in providing its combined tester and gun perforator?

A. Yes, sir. [1027]

Q. An another object of the Spencer patent was: to provide a projectile firing formation tester whereby a thorough investigation of the zone perforated including production tests may be made, the tester permitting washing of the formation through the perforations made by the gun, such as by operation of a swab in the tubing string or circulation of fluid all without removing the formation tester. That was an object of the plaintiff in providing its combined tool, and that object was accomplished by the tool, was it not?

A. I don't understand that "washing." I can't answer that.

Q. Is it possible with the combined tool of the plaintiff to wash after perforating?

A. Not my tool. It would not be practical.

Q. Is it possible with your tool to wash, if the combined tool becomes stuck in the well?

A. Yes, we can back-pressure.

(Testimony of M. O. Johnston)

Q. Then with that understanding of the term "washing" in my question, this object, stated object of the Spencer patent, was an object of the plaintiff's in providing its tool, and it was accomplished, wasn't it? That is true, isn't it?

A. Well, I suppose it could be under certain circumstances, but it wasn't designed for that purpose. [1028]

Q. Is it your opinion, Mr. Johnston, that it is safe to gun perforate beneath a set packer?

A. Not if the valve is closed, not under your drill pipe or tubing, it is not safe; no, sir.

Q. If the valve is open, it is a perfectly practical and safe operation to gun perforate beneath the set packer, and a prudent operator would do it; is that correct?

A. If the valve is open and not choked, if it has a wide opening.

Q. Your answer would be—

A. I think you could do it.

The Court: That is the tester valve?

The Witness: Yes, sir.

Q. By Mr. Foster: Now, suppose that the tester valve is closed and the packer is set, what is the basis for your answer that it would be unsafe to gun perforate beneath the set packer? Have you made any tests or experiments?

A. I haven't made any tests, no, sir; but I could visualize if you squeezed your fluid under your packer and built up a pressure, instant of pressure under that, that something would have to give; either your casing would have to burst or your packer give or blow it up in the hole; something would have to give if you add a blast to that. Now, that is only visual. [1029]

(Testimony of M. O. Johnston)

Q. You have no reports of investigations by others or you have no investigations by yourself to confirm that circumstance you envision?

A. I have heard that those tests have been made, Mr. Foster, but it is only hearsay.

Q. They were not reports made by employees or any one retained by your company to your company?

A. No, sir.

Q. With the combined tool, subject of the suit here, the plaintiff's tool, on occasion it has been used to perforate in oil as contrasted with fresh water mud, has it not?

A. You mean oil in the casing?

Q. Yes. A. Yes, sir; it has.

Q. And what was the reason that oil was used to replace the mud during the perforating?

A. Well, I don't know what the occasion would be. It was probably a low head sand.

Q. By "low head" you mean low pressure sand?

A. Low pressure sand; yes, sir.

Q. You have encountered in your practice the perforating of low pressure sands at considerable depths, have you not?

A. Oh, I think so, yes, sir; a lot of depleted sands [1030] in the field.

Q. And those pressures might be as low as 50 or 100 pounds?

A. Oh, I suppose they could be; yes, sir.

Q. And at depths in excess of 5,000 feet?

A. I think so.

(Testimony of M. O. Johnston)

Q. Why is it that they use oil in these low pressure sands when they perforate?

A. Well, they would prefer that the oil would go back rather than the water.

Q. Because of damage of the water to the low pressure sands?

A. Well, it would be easier to bring the well in if it was oil instead of water; it would come in more readily.

Q. Is that because if you used a water mud in those low pressure sands, the water would pass out of the mud and invade the low pressure sands and diminish the productivity of the low pressure sands?

A. I don't know about diminishing it. Water always comes out, as a usual thing comes out, anyway, in my experience.

Q. I do not understand, Mr. Johnston, your former answer. I got that the water always comes out, anyway, from the low pressure sand. Why does the operator bother to [1031] substitute oil for the fresh water mud before he perforates into that sand?

A. I said it would come out more slowly. For instance, if you are testing in a sand and your water goes back, you have to accumulate that water in your tester, and probably put or could put the same amount in your drill pipe as the pressure within the sand.

Q. And diminish your oil sample to that extent; is that a fact?

A. Well, it could; yes, sir.

Q. And another reason, I suppose, would be for a prudent operator to substitute oil for fresh water mud in

(Testimony of M. O. Johnston)

perforating into a low pressure sand is to avoid the impendence of the mud cake?

A. Yes, sir. Usually, under those low pressure sands, they know what they are doing when they are going into them; so therefore they prepare for it.

Q. Wouldn't you say it was common practice in low pressure sands to substitute oil for the fresh water mud for the reasons you have given before perforating and testing?

A. Well, I think, if I was an operator and going to do some work on a low pressure sand, I would do it. I wouldn't say it is common practice. Sometimes it is whether the oil is handy or not, or getting the oil when [1032] it would cost more to get the oil and put it in there, or cost more to draw the water out. That would depend on circumstances, I believe.

Q. You have said that the water that comes out may come out slowly after it has invaded the low pressure sands. You have observed, haven't you, Mr. Johnston, wells with low pressure sands where the invaded water did not come out for days?

A. No, sir. Mr. Foster, I can give you an example in this Dominguez field, and it is the only one that I know of—I think it is between 4,000 and 5,000—that I personally ran the tester myself. Now, the operator knew that it was a low pressure area, and we made an accumulation of—oh, I don't remember the exact number of feet within the drill pipe, but it had ceased coming in; so we drew the tester quickly, as quick as we could, and put it back in and tested, and this time, why, the water came in and then the oil, but the water was filtrate water. They knew that. They tested it to see the salt

(Testimony of M. O. Johnston)

content, so on and so forth, so they knew what they were doing. I think I made two of such tests. That is the most water I ever drew out of a sand. I have had occasions to test new sands that would not get any filtrate water at all. Now, why, I don't know. We would get our rat hole mud and then our oil. So some things in those wells we just [1033] can't explain, that is all.

Q. Now, you spoke of measuring the salinity of that water that was secured in the test. It is not uncommon at all, after the test is taken, to determine the salinity of the water in the sample, is it?

A. Well, no. Sometimes they have to what they call titrate that water to get the salt content of it. In fact, we used to, when I first started making casing tests, the men themselves carried a titration set with them.

Q. That is your men? A. Yes, sir.

Q. And the purpose of determining the salinity of the sample of water secured in the test is to determine the zone or source from which that water came in the well, isn't it?

A. Well, I suppose the operators do that. Now, this was on—we were on casing tests alone during that. We know what the salt content of our mud is and, as it picks up, if we get a rise of the fluid, why, they take samples at different places and at the bottom of the sample or somewhere near the bottom, the same as the mud, so they consider that must be water somewhere, accumulation back of the pipe.

Q. Now, it is not uncommon to make a salinity test or to use a salinity test to determine the source from

(Testimony of M. O. Johnston)

which [1034] or the zone from which the water came down in the well; that is true, isn't it?

A. I don't understand just what—

Q. I don't mean to confuse you.

A. No, I know.

Q. My question is not clear, probably. It is my understanding that the salinity of the water in different levels of the formations down in the well differ usually, so that if we can accurately determine the salinity of the water in the sample, we get some indication of which zone or sand, which level of the sand it came from; that is true, isn't it?

A. I think that would be correct.

Q. So that you would agree, then, that, to the extent that fresh water from the mud invades the formation after perforating and before testing and returns with the sample of oil and water from the formation into the tester, you have masked and made difficult of determination the source of the water from the formation? You would agree to that, wouldn't you?

A. We would know whether it was water that had filtrated back or whether it was salt water. However, at times the oil sands do have a salt water in them and you don't always know just what the salt water content is. So if your filtrate water goes back in this salt water that [1035] is already in there, it will mix with it and it may be hard to determine whether that is wash water or water that has some salt water. Usually, in a proven field they know what sands, what the salt content happens to be in those sands; but in a wildcat field they would not know that.

(Testimony of M. O. Johnston)

Q. In a proven field where they know the salt content of the different layers of sand has different values, you agree that, to the extent the fresh water in the mud invades the formation and returns into the tester, where the salt water is from the formation in the oil, you have masked or made difficult of determination that source of the salt water, which layer or bed it came from?

A. In the proven fields?

Q. Yes. That is true, isn't it?

A. If it is not too badly—well, I suppose the answer would be yes on that.

Q. And don't you agree that, with the use of the separate gun perforator and tester, we have, by virtue of a longer time of contact of mud with the perforated formation, we have a greater invasion of the fresh water into the perforated formation than is had when we use the plaintiff's combined tool?

A. Well, that is a matter of time. I think it is a well known fact that water will filtrate back in sand.

Q. You agree with my statement? [1036]

A. Well, yes; it will build back in.

Q. You have spoken of the practice of substituting for the fresh water mud opposite a low pressure formation oil before perforating. How long has that been done to your knowledge?

A. Oh, that has probably been done 30 years or more. I couldn't remember.

Q. As long ago as 30 years that was done to avoid the ill effect of mud cake formation and fresh water

(Testimony of M. O. Johnston)

invasion to which you refer? It had the same purpose then that it has now?

A. Oh, it had the same purpose then as it has now; yes, sir.

Q. With the use of your combined tool have you ever known of it to be operated in this manner: That is, washing with oil the perforated formation after perforating and before taking a sample?

The Witness: Read that question again, please.

Mr. Foster: It may not be clear.

(Question read by the reporter.)

A. I don't know whether we have or not.

Q. You do recall that in your use or your observation of the use of the separate perforator, whether gun or chemical, and separate formation tester there have been operations in which the perforated formations are washed [1037] with oil before testing?

A. I can't recall, offhand, but I suppose it has been done.

Q. Have you observed the perforated formation washed with water before testing, salt water?

A. Well, I don't know that, either. We have washed wells when we were going to bring them in with fresh water. That is the only way we had to bring them in in the old days.

Q. In your observation of the separate tester, uncombined with the gun perforator, have you observed any steps to eliminate or reduce the impedance to the inflow of fluids by virtue of the mud cake before taking the tests?

A. I can't say that I have; no, sir.

(Testimony of M. O. Johnston)

Q. You have observed with the use of a separate tester and with the use of your combined tool a manually controlled bean at the surface to control the inflow of fluids into the tool, haven't you?

A. I certainly have not.

Q. You have stated that the combined tool has an advantage over the separate gun perforator and tester in the saving of time; and you have said that, with the passage of a longer time, there is a greater damaging infiltration of fresh water into the formation. Do you [1038] agree that with the use of the combined tool you have the advantage over the separate tool of a better sample by virtue of less fresh water invasion into the formation?

A. We never have given it much thought, but listening to Mr. Law's testimony up here, why, evidently it goes back and there must be some more. Our tests with the gun separately and with the gun being run on the line have been as successful as the ones that we have run the gun and the testing tool together. I haven't noticed any difference.

Q. Have you run the separate tools and the combined tool under the same circumstances, taking a sample in the same well, at the same zone, with the same pressures, with the same mud columns and so on?

A. Well, I would have to look that up, but I suppose so, with the amount of tests that we run, that we certainly have under the same circumstances. [1039]

* * * * *

(Testimony of M. O. Johnston)

By Mr. Foster:

Q. Mr. Johnston, the Texas company, the Johnston Oil Fields Service Corporation, is operating under this license, Plaintiffs' Exhibit 7, under the Collins patents, as well as your California company; is that true?

A. Yes, sir.

Q. As a matter of fact, each of those two companies is licensed under all of the patents and applications of the other company in this field of testing and perforating; that is true, isn't it?

A. Yes, sir.

Q. Is the Texas company contributing to the expense of this litigation here?

A. I haven't given that any thought.

Q. Your answer is that they may be?

A. That will be up to me whether they do or not. I own both of them. [1040]

Q. In other words, you control both companies?

A. Yes, sir.

Q. And if you elect to have them pay part of the costs, they will do so, that is, the Texas company?

A. Yes, if I do.

Q. Is there any person, firm or corporation, other than the plaintiff here and possibly the Texas company, contributing to the expense of this litigation?

A. No.

Q. When you employ a gun perforator separately, that is, without a tester in combination with it, Mr. Johnston, as you draw the perforator out of the well I understand that it exerts somewhat of a swabbing or lifting action upon the fluid in the casing; is that correct?

A. Well, that would depend on what size gun you are running in this casing. If you don't have much

(Testimony of M. O. Johnston)

clearance between the casing and the gun, why, there would be quite a bit of friction to pull it out.

Q. With some of the guns of some of the dimensions which you have operated, as you withdraw the gun from the casing after perforating, there would be some swabbing action, wouldn't there?

A. I haven't operated any guns with the line, a line gun. [1041]

Q. Do you agree that if a gun perforator were operated on a line, it would, as it was drawn from the well, exert somewhat of a swabbing action upon the fluid in the casing?

A. In the instance I have stated, if it fit real close, why, it would probably have some friction. I don't know about the swabbing action. You would slow it up until it would by-pass, draw it slowly out, and it would not have any swabbing action.

Q. If you drew it out with normal speed that a gun perforator would be drawn out on a line, then wouldn't you expect there to be some lifting and swabbing action with regard to the fluids in the casing?

A. I don't think you would have gotten the gun down to start with if it would do that. You would not have enough clearance.

* * * * *

Q. It is a fact, isn't it, Mr. Johnston, that in [1042] your many years of operating the tester alone, you many times encountered difficulty in lowering the tester to the

(Testimony of M. O. Johnston)

level where you wanted to take the sample because of the sanding up of the well?

A. Well, not altogether a sanding up, Mr. Foster. Sometimes we suppose that sand bridges, other times it is mud balls and perhaps mud cake that formed on your sands, that has grown up. They haven't reamed through it, or a great many times we have to withdraw the tester. Now, this is in an uncased hole I am speaking of now, that you can't always get to the bottom. It has probably been considerable time since they have drilled through, reamed back through the hole.

Q. You have had that same trouble to some extent, using the tester in cased holes, haven't you, after perforating?

A. Well, we did in the early days, Mr. Foster, but not any more so much. It is usually now the fault of not getting the cement off the walls of the pipe, or not drilling the float collar out. But when I first started running water shutoff tests, why, we did encounter mud balls in the hole for some reason or other, but we don't now.

Q. You do not mean to say that never, with the tester inserted in casing after gun perforating, never have you met an obstacle in the hole such as a sand bridge that [1043] prevented you lowering the tester? You don't mean that, do you?

A. Yes; I mean that. If your pipe has not been perforated up above, you are going through; there is no reason for a sand bridge being in there at all.

Q. I am assuming that the casing has been perforated. Haven't you encountered some difficulty on some occa-

(Testimony of M. O. Johnston)

sions in lowering a tester because of the sanding up of the well?

A. We are now testing below perforations?

Q. Yes, Mr. Johnston.

A. Oh, I suppose there has been occasion in the past. I don't know that it has. If it has, why, it certainly should put mud back in it and we would run through it in length of time. We have stuck drill pipe.

Q. Have you ever had any experience with separate tester in which your tester became stuck in the well and you encountered difficulty in removing it?

A. Yes, sir.

Q. Have you had any similar difficulty running gun perforators?

A. We probably have, one or two occasions. I don't know. I can't recall offhand.

Q. Pardon me. Had you finished, Mr. Johnston?

A. Really, I can't recall offhand. We probably have. [1044]

Q. On these occasions that you know of, when the tester became stuck in the hole, what operations were involved? Did it require a fishing job?

A. Well, we usually run a left-hand joint above our equipment or any equipment that is run in the well, we call a safety joint, that, if something does foul it up, that we can back off. Then they go in with the proper fishing tools and a set of jars and jar it out, or try to jar it out, which they usually do.

Q. Sometimes they are not able to get that out at all, are they, that tester?

A. Out of the casing?

(Testimony of M. O. Johnston)

Q. Yes.

A. I don't know of any instance they may have left them in there, but parts of it, they mill it out.

Q. You have known of some instances in open formation where they could not get the tester out, haven't you?

A. Yes, sir.

Q. And if they are successful in that fishing job, with the proper tools and jars, it is a time-consuming and expensive operation, is it not?

A. Well, sometimes it is. It is some time involved; yes.

Q. Do those fishing jobs or tools becoming stuck in the well so that they can't be removed, does that [1045] endanger the well? Does that make a risk of loss of the well?

A. I haven't known of them losing any wells on that account. They sidetrack it or fish it out. They usually fish it out.

Q. But whether they do a fishing job successfully or mill it out or sidetrack in drilling, that requires considerable time during which the well cannot, of course, produce; that is true, isn't it?

A. Well, they can't complete the well until they clean it up.

Q. Yes. And those operations, both of them or any of them, require considerable time?

A. Yes, some time is involved, maybe one trip, maybe a dozen trips.

Q. Or 50 trips? A. That is right.

Q. Now, isn't it a fact that using the combined tool instead of the separate gun perforator and tester, there

(Testimony of M. O. Johnston)

is greater safety as regards the tools becoming stuck in the well and as regards the necessity for fishing, milling or sidetracking operations in the well?

A. No; I wouldn't say that. [1046]

Q. Wouldn't you say that if you run a gun perforator separately and there is a danger of its becoming stuck in the well, and you run a tester separately and there is a danger of it becoming stuck in the well, that the danger is reduced to run them both as a combination upon the same tubing or drill pipe?

A. Not for argument, Mr. Foster, but there is some danger in running the gun with the tester over and above just running the tester alone, because you have that much more on the bottom of it to sand up, and when you shoot your well and you set your packer and it heaves in, then you have a stuck job. If you are running a gun, and you shoot and pull it out, well, they lose guns too.

Q. But over all isn't there less danger, less of those dangers I have named, when we use the combined tool than when we use the separate gun perforator and tester?

A. There are two operations and I suppose probably in some cases, being two operations, there may be. I don't know. I had never thought about it that way.

Q. Thinking about it now, don't you agree with me there is lesser danger in the combined tool?

A. Well, in thinking about the gun on the bottom of the tester, and things that could happen to the gun with the tester, I will say it would be just about equal.

Q. Well, certainly, if the gun perforator is run in on [1047] cable separately, and then the tester is run in separately, there would be greater—the dangers I have

(Testimony of M. O. Johnston)

named would be greater than in using the combined tool run in on tubing or drill pipe; that is true, isn't it?

A. Well, separately using your gun, it can sand up, I suppose, and it can also sand up with it on the tester. You have that much more added to it.

Q. So that your answer to my question is "Yes," the danger is greater, or these dangers, with the separate tools than combined?

A. I would say about equal.

Q. About equal when the perforator is run in on the cable separately?

A. Yes, that is correct, because we have added the gun on the bottom of the tester, which is that much more to the tester, and then if the sand heaves up, when we relieve that pressure, we have that gun to stick where we don't have it if we had run the tester separately. Now, if you run the gun on a line, you have your mud fluid down there, and you shoot, and there isn't action or shouldn't be coming out, so that I will say the danger of running the line gun, just thinking about it at this time, would probably be equal. I don't know.

Q. You have never and your plaintiff company has never performed the operation of using for hire a gun perforator [1048] run in and out of the well on a line, have you?

A. No, sir, we don't hire the gun. The companies hire the gun.

Q. But the plaintiff company does do perforating, operate a perforator, a gun perforator, separately from a tester, doesn't it?

A. Well, we have run this gun that we have on drill pipe or tubing separate from the tester, yes, sir.

(Testimony of M. O. Johnston)

Q. But never on cable, Mr. Johnston?

A. Never on cable, no, sir.

Q. So that your estimate of the dangers involved in running a gun perforator on cable is not based upon any experience of your own?

A. No, sir, I was just thinking about it here.

Q. Is it not true that always in California when you use your combined gun there is used with it a pressure recorder on the bottom, which is illustrated in this large drawing, Plaintiff's Exhibit 14?

A. We usually run two pressure recorders, yes, sir.

Q. But you never run without at least one pressure recorder on the combined tool?

A. That is correct.

Q. Now, that pressure recorder, as I understand it, makes a running record of the pressure as the combined tool is lowered down into the well, and while it is in the well, [1049] and coming out of the well, doesn't it?

A. I didn't understand a word in there. I didn't hear it.

Mr. Foster: I am sorry. Will you read the question, please?

(The question was read.)

The Witness: Yes, sir, it records all the way down.

Q. By Mr. Foster: The pressure recorder or pressure bomb doesn't affect in any way the quality or quantity or nature of the sample taken by the tester, does it?

A. No, sir, it does not.

Q. And, conversely, the tester does not affect the readings or recordings of the pressure recorder or bomb, does it?

A. No; no, it doesn't.

(Testimony of M. O. Johnston)

Q. In other words, the tester and recorder each just do their ordinary function, unmodified or affected by the presence of the other?

A. Yes, sir, they do the separate jobs.

Mr. Foster: May I have marked for identification as Defendant's Exhibit—

The Clerk: Q.

Mr. Foster: —Q, the printed copy of the U. S. Patent to T. V. Moore, No. 2,189,919, issued February 13, 1940, for a method and apparatus for formation pressure testing. [1050]

Q. By Mr. Foster: I direct your attention, Mr. Johnston, to Fig. 1 of the patent, Defendant's Exhibit Q, for identification. Does that illustrate in a general way the pressure recorder or pressure bomb to which you have been referring? A. Yes, sir.

Q. And the plaintiff company is licensed under and pays a royalty under that patent, Exhibit Q for identification, doesn't it? A. Yes, sir.

Mr. Foster: May I have marked for identification as Defendant's Exhibit R a printed copy of U. S. Patent No. 2,161,233, issued June 6, 1939, on the application of Frank E. O'Neill, entitled "Well Testing Device"?

The Clerk: Defendant's Exhibit R, for identification.

Q. By Mr. Foster: I direct your attention to the drawings of Exhibit R, for identification, and ask you if that illustrates in exterior appearance a pressure bomb of the character or type which you use upon your combined tool, Mr. Johnston. A. Yes, sir.

(Testimony of M. O. Johnston)

Q. And you know that the Frank E. O'Neill who was the applicant for this patent is the Mr. O'Neill who testified as a witness for the plaintiff in this case?

A. Yes, sir. [1051]

Q. I note on the patent face it states that it is assigned to Mordica—

A. That is correct.

Q. —O. Johnston?

A. Yes, sir.

Q. Is that you, Mr. Johnston?

A. Yes, sir.

Q. And you are still the owner of this patent?

A. Yes, sir.

Q. From the fact that you are paying royalty under the Moore patent, Exhibit Q, for identification, I presume that you regard it as valid, Mr. Johnston?

Mr. Mellin: Your Honor please, I don't see where it is material here whether the Moore patent is valid or invalid. It hasn't anything to do with the validity of the patent in suit or the question of its infringement. Because that patent is owned by the Standard Oil Company and the Shell Oil Company and this man pays royalty can be no indication whether it is valid or invalid, and it hasn't any bearing on this suit.

The Court: How would it be competent, Mr. Foster?

Mr. Foster: I think for this reason, your Honor. I have in mind the questions that the court asked Mr. Leonard Lyon in the Shick Razor Company case about the separate function of the various elements. The witness testified that [1052] the pressure recorder does not affect the operation of the tester, that each performs its own function. May I just read claim 19 of the

(Testimony of M. O. Johnston)

Q. Now, if you know, Mr. Johnston, what percentage of tests made in the Midcontinent area—that includes Texas and the Midcontinent—are made in open hole as against those made in casing?

A. 90 per cent of them are made in open hole; 10 per cent of them would be in casing.

Q. And that is for the reason that the law there does not require water shutoff tests?

A. That is correct. [1071]

* * * * *

Mr. Foster: I now wish to offer portions of the testimony of Rodney S. Durkee, portions of which have already been offered by the plaintiff. The first portion—

The Court: That deposition is marked as Exhibit 30, for identification?

Mr. Foster: Yes, your Honor. The first portion is on [1252] page 25, commencing at line 13:

“Q. Do you recall a conversation, or a number of conversations, with Mr. M. O. Johnston, who is present here, relative to the Lane-Wells Company granting Johnston a license under the gun perforator patents which you have?

“A. I recall one or two conversations.

“Q. I wonder if you would relate, in substance, what was said in those conversations, if you can recall?

“A. I am not certain whether the first conversation was in person or over the telephone, but my recollection is that Mr. Johnston pointed out the

(Deposition of Rodney S. Durkee)

desirability of combatting apparent inroads of a competitor in the formation testing service, and suggested that our two companies ought to get together on a service of that kind.

"Q. Do you recall when that was?

"A. My recollection is that it was in 1941.

"Q. Go ahead. I didn't mean to interrupt you.

"A. I believe I told him at that time that I would look into the matter, and that subsequently I wrote him a letter, in which I offered him a license under our patents."

Then on page 29—the part I have read was testimony during the direct examination of Mr. Durkee by Mr. Mellin. The parts I will commence now to read are on cross examination.

* * * * *

Mr. Foster: (Reading)

"Q. Mr. Durkee, I show you a carbon copy of a letter dated May 5, 1941, to Mr. M. O. Johnston, the original purporting to be signed by Rodney S. Durkee, and ask you if that is one of the letters to which you referred in your direct examination?

"A. I am confused as to whether I referred to this particular letter or not. I referred to the letter in which I made the $66\frac{2}{3}$ per cent offer, but I don't believe I referred to this letter.

"Q. If you will read further down, I think you will find— [1254]

"A. I am sorry. I amend my answer to say that this is the letter I referred to.

(Testimony of M. O. Johnston)

think it is absolutely immaterial because whether we would have the right to show there is common co-operation between the tester bomb and a tester that isn't present between the gun and the tester, they function separately and they act differently, and we get into that trial instead of this.

The Court: That probably would be a matter of argument before this case is over, but I don't think it is a matter of testimony. Objection sustained. [1055]

Mr. Foster: Might I ask plaintiff's counsel, then, his position with respect to the validity of the two patents, and particularly the claims which I have read?

Mr. Mellin: If your Honor please, I never saw the patents in my life.

The Court: Perhaps Mr. Mellin will study them before the end of this case and state his opinion. [1056]

* * * * *

Q. By Mr. Foster: Mr. Johnston, do you have any knowledge from observation, experiments, investigations or reports to you or your company with regard to the depth of penetration of projectiles which are fired by the gun perforators into the formation, that is, the plaintiff's gun perforator?

A. No, sir; I don't, only through tests of cement. All we have been concerned with mostly is getting through our pipe and two strings of pipe and go out in the cement. I have never made any measurements to that effect.

Q. Have you made any determinations or any been reported to you by your employees as to the depth of

(Testimony of M. O. Johnston)

penetration into the hardened cement beyond the casing in [1059] such demonstrations?

A. Oh, I have seen cuts and photographs in oil periodicals and I don't—and I have witnessed those that have gone into the cement.

Q. What is the greatest distance you have witnessed of penetration into the cement beyond the casing?

A. The cement has been between the casing, just going out into the formation. We have a test well out there that we test them in, but I don't know how far it goes back in there.

Q. Have you observed any operations or tests, or have you had reports made to you by those in your employ or retained by you which indicate to you whether or not when your gun perforator shoots a projectile out into the formation, fracturing or fissuring of the formation occurs adjacent to the path of the projectile?

A. No; I haven't. I don't know how they would know.

Q. So there have been no surface tests that indicate either way to you whether or not such fracture occurs in the formation as the result of gun perforation?

A. No, sir; we haven't made those tests ourselves.

Q. Have you any observations or reports made to you which indicate to you that by gun perforation a well has been caused to produce more than it did before gun perforation from the same zone? [1060]

The Witness: I would like that question again, please.

Mr. Foster: Surely. May the court reporter read it, your Honor?

The Court: He may.

(Testimony of M. O. Johnston)

(Question read by the reporter.)

A. I don't know whether I have had or not, but I would imagine, if they have shot an old liner that has been plugged up, either shot it or perforated it with a mechanical perforator, that would certainly give up more than it was giving up before they did do it. I don't know as I have had it reported to me, but that would be only reasonable to expect.

Q. Have you made any observations or had any reports made to you that would indicate that the disturbance caused by gun perforating in the formation causes it to produce more than it otherwise would?

A. No, sir; I haven't.

Q. Nor have you had any observations or reports indicating contrary-wise?

A. No, nor contrary. In our tests we do not always know what we are shooting into. That is up to the operator, and some of the information is their own. They don't give it to us. They want to shoot so many holes, we go out and shoot it and test it. We don't know what we are testing for.

Q. Then you agree with the statement contained in my [1061] last question?

A. I will agree with that.

Q. When you have operated the separate tester and not secured a sample, is that a reliable indication that you would not have secured a sample with the combined tool?

A. I don't understand that question.

Q. Let me reframe it. When you have operated after perforating to secure a sample with a tester as a separate tool, and you have secured no sample in the

(Testimony of M. O. Johnston)

tester, is that a reliable indication that you would not have secured a sample from the same zone had you used, instead of the separate tools, the combined gun perforator and tester?

A. Do you mind if I put it the way I think? They have used the gun separately, and then we had used the tester separately, and we didn't get a test in that manner, an then we ran them together and we still didn't get a test?

Q. No; that is not my question. My question presupposes this operation, Mr. Johnston: That you had run or someone had run a gun perforator separately from the tester, and then in the performance of your separate testing service you had run a tester into the well separately from the gun perforator to secure a sample, and you secured no sample; now, is that a reliable indication that if, instead of running the separate tools, [1062] you had run the combined tool, you would not have gotten a sample?

A. No; it is not a reliable indication. However, with our pressure bombs on there, Mr. Foster, we would have known whether the bullets had penetrated the formation—I mean the casing, or whether it had not penetrated, or whether the tool had stopped up in the bean, or whether the perforations had stopped up?

* * * * *

Q. Never before the applications for the patents in suit, the Lane and Spencer patents, did you ever see, hear of, or know of any use, invention by others, or any disclosure in a printed publication or a patent of a combined gun perforator, packer and formation tester in a

(Testimony of M. O. Johnston)

unitary tool that could be run into and withdrawn from a well as a unit; that is true, isn't it?

A. As a unit; only separately.

Q. With that qualification, you agree that that is true? [1063]

A. That is true up to the time of that patent.

Q. Of the patents in suit?

A. Of the patents in suit.

Mr. Foster: That is all.

* * * * *

Cross Examination

By Mr. Mellin: [1064]

* * * * *

Q. Now, with respect to the exhibit, Defendant's P, Mr. Johnston, there is listed on there the number of combined gun and tester runs for the years 1946 and 1947. Now, those would be all runs in well casing, would they not? A. Yes, sir.

Q. If you know, what percentage of those runs would be water shut-off tests and what percentage would be for what we call production tests of formation? [1066]

A. It would be about 90 per cent water shut-off tests.

Q. And the 10 per cent?

A. That would be production tests.

Q. At the same time you gave me those figures in response to Mr. Foster's request, you also gave me—

May I have this marked for identification?

The Witness: May I change that, Mr. Mellin?

Mr. Mellin: Why certainly, if it is not correct.

(Testimony of M. O. Johnston)

The Witness: I think in the combined gun and tester runs, that probably the production tests would not be any more than two per cent, in the gun and tester run together.

Q. So there would be approximately 98 per cent casing water shut-off tests and two per cent production tests? A. Yes, sir.

The Clerk: This document will be 34 for identification, Plaintiff's, "Record of casing and formation tests."

Q. By Mr. Mellin: I show you what is labeled "Record of casing and formation tests," which has two columns. The left one shows "total casing tests with and without gun." And that refers to the tests made in casing; isn't that correct? A. Yes, sir. [1067]

Q. And, for the year of 1946 there were 2,594 of those, and for the year 1947 there would be 2,823. Now, those include the total shown on Exhibit Defendant's P, isn't that correct? A. Yes, sir.

Q. Now, of the casing tests which you made into perforations, using the gun and tester separately, if you know, what percentage of those tests were water shut-off tests? A. 90 per cent of them.

Q. And 10 per cent would be production tests?

A. Yes, sir.

Q. Could you explain to us, please, why in the use of the combined gun and tester, why is that used less and for making production tests than is the gun and tester run separately, if you know?

A. Well, usually, in California our sand bodies are quite thick and in running the combined tool, gun and tester, why, we shoot four shots to the foot at the present

(Testimony of M. O. Johnston)

time and about, oh, 30 to 40 foot at a time would be as much as we could shoot, or safe to shoot; and so, shooting, say, 200 foot of sand, it would take entirely too much time. You could take a line gun and shoot 50-foot at a time quickly, and do that job much quicker. That is the reason we do not do very many production jobs with the combined tool. [1068]

Q. In water shut-off jobs you only have to shoot just the four holes; you do not have that same condition?

A. Yes; that is correct.

Q. And therefore, if you had a thick sand, say, 200 feet, as you have explained, the fact is that running a line gun and a tester separately would be more economical as far as time is concerned than running your combined tester and gun? A. Oh, yes; much more so.

Q. Now, I noticed in Exhibit 34—

Is it 34, Mr. Clerk?

The Clerk: 34 for identification.

Q. Yes; 34 for identification, there is a right-hand column "Formation tests in open formation without gun," the first for the year 1946, there is 1,483 of them against 2,594 tests made in casing; in 1947 there is 1,696 made in open formation, uncased holes, as against 2,873 made in casing. Now, Mr. Johnston, in those tests made in open holes, uncased, what sort of a packer do you use, if any?

Mr. Foster: Just a moment, your Honor. I object. I do not believe any foundation has been laid for this document as to its accuracy, and Mr. Mellin is quoting copiously from it into the record.

The Court: Your objection is good.

(Testimony of M. O. Johnston)

Q. By Mr. Mellin: Did you take these figures directly [1069] from your records, Mr. Johnston?

A. Yes, sir.

Q. And you know as a matter of fact, they are correct, of your own knowledge? A. Yes, sir.

The Court: Do you offer the document?

Mr. Mellin: I offer it into evidence, your Honor.

The Court: Is there objection?

Mr. Foster: No objection.

The Court: Plaintiff's Exhibit 34 for identification is received into evidence. Did you intend to offer Q and R for identification?

Mr. Foster: Yes, your Honor; I do.

* * * * *

The Court: Objection overruled. Defendant's Exhibits Q and R for identification are received into evidence.

Mr. Mellin: Would you read the last question, Mr. Reporter, please?

(Last previously unanswered question read by the reporter.)

A. We use rat hole packers and straight hole packers and combination packers.

Q. A combination packer is a combination rat hole and [1070] straight wall packer? A. Yes, sir.

Q. But you do run tests with a straight wall packer?

A. Yes.

Q. Is that a common procedure or an uncommon procedure?

A. It is a very common procedure. Most of our tests in the Midcontinent are straight hole tests.

(Testimony of M. O. Johnston)

Moore patent under which the plaintiff pays royalty. It is very short.

“In combination, a formation tester for a well bore including a packer adapted to seal off a formation from the remainder of the bore, and a pressure recorder below said packer adapted to be positioned adjacent said formation to record the pressure thereof when said packer is set.”

And may I read claim 2 of the O'Neill patent, which is even shorter :

“In combination with a packer having a fluid passageway there through and a valve structure to control the flow of fluid, an intermediate unit comprising a tubular housing connecting the packer and the valve structure and providing a fluid passageway there between, and a pressure recording device detachably mounted therein and around which fluid will flow from the packer to the valve structure.” [1053]

Incidentally, the O'Neill patent points out in its specifications that each of the elements here specified is old, that the packer is an old type, the valve structure is of any old structure, as well as the tubular housing is of any old housing, and the recording device is not even illustrated in any detail, it is any conventional recording device. Now, having in mind the witness' testimony with respect to the lack of co-operation between these elements and having in mind that the plaintiff pays the Moore patent a tribute of royalty, which is a tribute to its validity, and pays to the O'Neill patent the tribute of continuation or ownership, and having in mind that the

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plaintiff and plaintiff's counsel are contending that the Lane patent is invalid for aggregation, where we have shown the co-operation between the elements, and some co-operation and a saving of time and money is admitted, I think we are entitled to have in the record a statement by the witness that the plaintiff regards the patent valid or invalid. And, furthermore, if the plaintiff is not qualified to give that statement, I think the court is entitled to request such a statement of plaintiff's counsel, as an officer of the court.

The Court: It might be from plaintiff's counsel. It might be a question of law. But, as I understood you, Mr. Johnston's testimony is that the plaintiff is the exclusive licensee, or at least a licensee under the Moore [1054] patent.

Mr. Foster: Yes, sir; not an exclusive licensee.

The Court: Being a licensee, I assume that that is an acknowledgment in Plaintiff's view that that patent is valid, so long as the plaintiff operates under the license. I think the plaintiff would be estopped to assert to the contrary, so long as the plaintiff acts as a licensee, being estopped so far as the owners of the patent are concerned, but not so far as the parties to this suit are concerned.

Mr. Mellin: Your Honor, if I may be heard on that point. The witness did say that each had its separate function. If that is going to stand in the record, I will have to show by the witness that that actually is not the case, that they don't have the separate function, and then we get into trying the Moore patent and not the Lane patent in suit. So I say it is immaterial. We have let it in that he is a licensee, for what it is worth, but I

(Deposition of Rodney S. Durkee)

"Q. Is it your recollection that the original of that letter was sent some time, on or about the date it bears, to M. O. Johnston?

"A. Yes.

"Q. And until the copy which you have in your hand was delivered into my custody a short while ago, where was that copy retained, do you know?

"A. In the files of the Lane-Wells Company.

"Mr. Foster: I will ask that the carbon copy of the letter dated May 5, 1941, be marked by the reporter as Defendant's Exhibit B-1 for identification."

I now offer the copy of the letter in evidence, your Honor, as the Defendant's next exhibit.

The Court: It has heretofore been marked as Exhibit 30-B-1 for identification.

Mr. Foster: May it be marked with the same number in evidence, your Honor?

The Court: Is there objection? [1255]

* * * * *

The Court: The objection is overruled. The letter will be received in evidence and marked as Defendant's Exhibit 30-B-1 in evidence.

Mr. Foster: I don't know whether your Honor has read the letter or not. Did your Honor read it? [1256]

The Court: Yes. There is a carbon copy attached here to the deposition. I read it before ruling on its admissibility.

(Deposition of Rodney S. Durkee)

Mr. Foster: I will continue to read from page 30, line 26, your Honor:

“Q. I show you a carbon copy of a letter, dated May 13, 1941, addressed to Mr. M. O. Johnston, the original of which is purported to be signed by you, and ask you if the original of that letter, to the best of your recollection, was mailed to Mr. Johnston on or about that date?

“A. Yes.

“Q. And has that carbon copy also been retained in the files of the Lane-Wells Company since the date of that letter, until it was delivered into my custody a short while ago?

“A. Yes, sir.”

I now offer in evidence as Defendant's Exhibit 30-B-2 the letter referred to by the witness.

* * * * *

The Court: The objection is overruled. The letter is received in evidence and will be marked Defendant's Exhibit [1257] 30-B-2 in evidence.

Mr. Foster: I don't wish to impose upon the court, but I propose to read from page 31 to 36 and offer the other letters which are attached as Exhibits to the end of the deposition. I am glad to continue or to refrain from doing so, as the court's pleasure may dictate.

The Court: You might proceed and read it into the record. Then it will appear in the record at this juncture.

(Deposition of Rodney S. Durkee)

Mr. Foster: Thank you. Beginning at page 31, line 17:

"Q. I show you two pages of typed carbon copy on the letterhead of Johnston Oil Field Service Corporation, dated August 14, 1941, addressed to Mr. M. O. Johnston, and purporting to be signed by H. L. Dear, and H. F. Atkins. Did you ever see that document before?

"A. I did.

"Q. When, to the best of your recollection, with respect to the date, Mr. Durkee?

"A. I saw it some time in the fall of 1941, after the date of the letter.

"Q. Where did you secure the copy?

"A. It was handed to me by Mr. M. E. Montrose, who at that time was general sales manager of our company.

"Q. And that was pursuant to the pending [1258] negotiations for the grant of a license by the Lane-Wells Company to Mr. Johnston, was it?

"A. Yes, sir."

I ask that a copy of the letter identified by the witness be received as Defendant's Exhibit 30-B-3.

The Court: Is there objection?

Mr. Mellin: The same objection as to immateriality, your Honor.

The Court: Who are H. L. Dear and H. F. Atkins?

Mr. Foster: I think Mr. Mellin can answer that. They were representatives in the Mid-Continent of M. O. Johnston Company.

The Court: Does that appear in the deposition?

Mr. Foster: I think it appears. If it does not, I believe I was told that at the time this deposition was taken by Mr. Mellin and Mr. Johnston.

The Court: Do you offer a stipulation on that subject, Mr. Mellin?

Mr. Mellin: I think that is so.

The Court: They are representatives of the plaintiff?

Mr. Mellin: They are representatives of the plaintiff in some capacity.

The Court: Very well. The objection is overruled. The letter will be received in evidence and marked Defendant's Exhibit 30-B-3, in evidence. [1259]

The Clerk: May I have the date, please, your Honor?

The Court: The letter, or it is a copy of a letter, is dated August 14, 1941. That is correct, is it not?

Mr. Foster: Yes, your Honor. May I continue?

The Court: You may.

Mr. Foster: I will read from page 32, line 15.

"Q. I show you a carbon copy of a letter dated October 23, 1941, addressed to Mr. M. O. Johnston, the original of which purports to have been signed by you, and ask you if it is your recollection that the original of that letter was sent to Mr. Johnston on or about that date?

"A. It is.

"Q. And has that carbon copy been retained in the files of the Lane-Wells Company since that date, until it was delivered to me a short time ago?

"A. Yes."

I now offer a copy of the letter identified by the witness in evidence as Defendant's Exhibit 30-B-4.

The Court: The same objection?

Mr. Mellin: Yes, your Honor.

The Court: The objection is overruled. The letter is received in evidence as Defendant's Exhibit 30-B-4.

Mr. Foster: Continuing from page 33, line 6: [1260]

"Q. I note that in Exhibit B-3 it is stated that the royalty on gun perforating would not exceed 15 per cent, and I note that in Exhibit B-4, in outlining the terms of a license to Mr. Johnston, in paragraph 9, it is stated: 'We will charge a royalty of 15% on that portion of your charge attributable to the gun perforating operation.' Was this offer, or any offer, based on a 15 percent royalty on the gun perforating charge, ever accepted by Mr. Johnston?"

Do you wish your objection read, Mr. Mellin?

Mr. Mellin: Please.

Mr. Foster: (Reading):

"Mr. Mellin: I object to that, on the ground that the letters speak for themselves, and we will stipulate that there was no license entered into."

There was no answer, so that that should appear in the record. (Continuing):

"Q. I show you a carbon copy of a letter dated November 21, 1941, addressed to Mr. H. F. Atkins, of Johnston Oil Field Service Corporation. Did you ever see that carbon copy or the original of which it is a copy before?"

"A. No; I did not see the original, but I have seen the carbon copy."

(Deposition of Rodney S. Durkee)

“Q. Can you state approximately when, with [1261] respect to its date?

“A. I saw it some time after the letter was written, because I believe at that time I was out of town, at the date of writing the letter.

“Q. Would you say within a few weeks after its date?

“A. Yes, within a short time.

“Q. Do you know where that carbon copy has been since the time you first saw the letter?

“A. It was delivered to me a short while ago—in our files.”

I now offer the letter identified by the witness in evidence as Exhibit 30-B-5.

Mr. Mellin: The same objection.

The Court: The objection is overruled. The copy is received in evidence and will be marked as Defendant's Exhibit 30-B-5.

Mr. Foster: Continuing on page 34, line 15:

“Q. Mr. Durkee, do you recall how the figure of 66 $\frac{2}{3}$ percent of the charge attributable to the perforating was arrived at?

“A. Well, at the time the matter was first broached we were doing a small amount of perforating in the field, which presumably was perforating required by the oil companies prior to testing. [1262] Those were what we called four-hole jobs. We felt that, if Mr. Johnston secured a license and operated a perforator in connection with his tester, that we would lose all or a large part of that perforating busi-

(Deposition of Rodney S. Durkee)

ness, which, incidentally, is very profitable, because of the relatively high charge per hole on the small hole jobs, and we calculated at that time that our direct field costs of operating our perforator service on jobs of that size was not over one-third of the sales price, and consequently we initially asked the $66\frac{2}{3}$ percent royalty, which would return us the same money as we would have gotten if we performed the job ourselves.

"Q. I notice that in Exhibit B-5 it is stated: 'We cannot offer you an exclusive license to operate a gun perforator in connection with a testing tool.' Was the reason for that your feeling or your fear that you had already granted licenses under your gun perforator patent, so that you were not in a position to legally grant an exclusive license?

"A. That was one of the determining factors, and the other was that it had never been our policy to grant exclusive licenses."

Continuing at the top of page 36:

"Q. Referring to the letter of October 23, [1263] 1941, of which Mr. Foster read a portion referring to a royalty of 15 percent on 'that portion of your charge attributable to the gun perforating operation,' that 15 per cent was due to the requirement stated in paragraph 4 of that letter, 'We will require you to purchase all guns and major parts thereof from us at actual cost of labor and materials plus our regular shop overhead currently charged at the time of manufacture plus 25% of the total of labor, material and overhead. You will be permitted to make minor re-

(Deposition of Rodney S. Durkee)

pairs necessary in the field without payment to us,' so that actually the royalty was not the only consideration, the 15% royalty was not the only consideration to be received by Lane-Wells?

"A. That is right."

If it will be of any assistance to court and counsel, I will be happy to state that, as we are at present advised, if no foundation need be laid for the introduction of the two letters which I have handed to Mr. Mellin—

Mr. Mellin: These letters, your Honor, are dated November 24, 1947.

Mr. Foster: That is correct.

Mr. Mellin: In other words, after this trial was started, and they are from one officer of the defendant to another. They are self-serving, and certainly they are after the suit [1264] was started.

Mr. Foster: They have not been offered yet.

Mr. Mellin: No, but he wants me to stipulate that they can be offered. I can't so stipulate.

Mr. Foster: Are you going to stipulate that the inquiry was made—

Mr. Mellin: I will stipulate the letters were written, but I will not stipulate that they may be offered in evidence or that they are material, or pertinent, or competent.

Mr. Foster: Would you stipulate that the inquiry was written and the reply to it was written pursuant to the regular course of business of the Lane-Wells Company?

Mr. Mellin: No, I can't stipulate that. I think it was for the purpose of this trial.

Mr. Foster: Then it might be necessary to call one other witness, other than the introduction of the documentary evidence.

The Court: Mr. Mellin is willing to stipulate the letters were written?

Mr. Foster: Yes.

The Court: Then I assume they speak for themselves?

Mr. Foster: Yes.

The Court: Do you offer them?

Mr. Foster: Yes, I offer them, or the carbon copies.

Mr. Mellin: Oh, no, I object. [1265]

The Court: You have no foundation objections?

Mr. Mellin: Not that they were written. I do not concede they were written in the regular course of business.

The Court: Were they sent?

Mr. Mellin: Yes, I will stipulate they were sent.

The Court: Sent through the mails?

Mr. Mellin: Yes.

The Court: Very well. Will you hand them to the clerk?

Mr. Foster: Yes, your Honor. May I have the other?

Mr. Mellin: They are self-serving, your Honor. They relate to issues of the suit written by the defendant to itself and after the trial commenced, that is, after the suit was brought.

Mr. Foster: I offer as Defendant's Exhibit AH-1 in evidence the copy of the letter dated November 21, 1947, to John T. Gardiner. That letter was written by Mr. Lyle Dillon.

And I offer as 2 under that same exhibit AH the reply, dated November 24, 1947, to Lyle Dillon from John T. Gardiner.

The Court: Now, are you gentlemen able to stipulate as to who these gentlemen are who wrote the letters?

Mr. Mellin: Yes, sir.

Mr. Foster: They are both employees of the Lane-Wells Company.

The Court: Officers of the company? [1266]

Mr. Foster: No, they are not officers of the company.

The Court: May I see the letters?

Mr. Foster: Yes, sir.

The Court: What is the purpose of the offer, Mr. Foster, to prove the truth of the facts stated therein?

Mr. Foster: Mr. Dillon is available. The other witness is not, your Honor. Mr. Dillon is here in the court room.

The Court: The person furnishing the information, I take it, is John T. Gardiner of Tulsa?

Mr. Foster: Yes, your Honor.

The Court: I will receive the letter of November 21, 1947, from Lyle Dillon to John T. Gardiner, being the inquiry, in evidence. The objection is overruled and that is received as Defendant's Exhibit AH-1. [1267]

* * * * *

Next, your Honor, the Lane patent in suit, Plaintiffs' Exhibit 1, states in its first paragraph:

"My invention relates to gun type formation testers, and the present application is a continuation in part or division of my co-pending application for: Method and means for controlling deep well gunfire for perforating casing: Serial Number 648,049; filed Dec. 20, 1932."

I next offer in evidence as Defendant's Exhibit AJ the file wrapper and contents of the application for that patent, the parent application, and the reference is cited in it. I have offered these for inspection to Mr. Mellin.

This establishes, your Honor, that the effective filing date of the Lane patent in suit is the filing date of the application for the patent of 2,029,490, the parent case.

The Court: It will be received in evidence as Defendant's Exhibit AJ.

Mr. Foster: Yes, your Honor.

The Court: I didn't quite follow you in that last remark.

Mr. Foster: The filing date of the Lane patent in suit, your Honor, is August 25, 1934, but by virtue of the fact that it is a continuation in part or division of the application for this patent, it has an effective filing date for the disclosures common to the tool of the parent case, the earlier case, which was filed December 20, 1932. [1274] So this carries back.

The Court: Were letters issued on that earlier application?

Mr. Foster: Yes, your Honor. This Exhibit AJ discloses that the letters patent are contained in it, on the back of it, and it will only require a cursory examination by your Honor of the drawings of Exhibit AJ to determine the claims in issue of the Lane patent in suit read on and describe that which is there disclosed. In other words, the disclosures of the Exhibit AJ and the patent in suit are common as regards the subject-matter of the claims in issue.

I might mention for the record also, your Honor, that an examination of Exhibit AJ will disclose that during its

prosecution in the Patent Office the defense of indefiniteness, here sometimes urged against the patents in suit, was presented by the Patent Office as to some of the application claims, and overcome by amendment and revision in the claims which were issued in the patent. Those rejections and those considerations of that highly technical objection appear at page 32 of Exhibit AJ, and while I am speaking of that subject, your Honor, the Lane patent in suit, the file wrapper of that patent, is in evidence as plaintiffs' exhibit, and on pages 14 and 18 of that file wrapper the highly technical defense of aggregation was considered, that defense sometimes being urged here by the plaintiff against this very [1275] patent.

The Court: What exhibit is that again?

Mr. Foster: That is Plaintiffs' Exhibit—

The Court: Plaintiffs' Exhibit 2?

Mr. Foster: I believe it is 2, your Honor.

I was referring to the file wrapper of the Lane patent in suit, which is Plaintiffs' Exhibit 3, your Honor.

The Court: You are referring me to pages 13 and 14?

Mr. Foster: To pages 14 and 18.

The Court: 14 and 18?

Mr. Foster: Yes, your Honor, where the subject of aggregation was considered, and likewise on page 18 this technical objection of indefiniteness is considered and overcome.

Does your Honor find it on page 14?

The Court: Yes, I have it.

Mr. Foster: Likewise on page 18 the highly technical objection of the indefiniteness was presented by the patent office with respect to some of the application claims, and

that likewise was overcome by canceling those application claims. [1276]

* * * * *

Next I desire to offer, your Honor, a license and cross-license agreement made between the Lane-Wells Company, the defendant here, and the McCullough Tool Company, a Nevada corporation, with a place of business in Los Angeles County, California. I have here an executed copy, or, the executed original of the agreement, bearing the corporate seal upon each of its pages, and I have shown it to plaintiffs' counsel. I have invited him, if he wishes, to confirm it as to execution by phoning any of the officers of either or both of the companies. I understand he is willing to waive proof of foundation, that is, proof of execution of the license [1277] agreement..

Mr. Mellin: That is correct.

Mr. Foster: And may I inquire through the court if he would also waive any objection to the use of a typed copy in lieu of the executed copy.

Mr. Mellin: No objection on that ground.

Mr. Foster: That is offered, then, as Defendant's Exhibit AK.

Mr. Mellin: Your Honor, I object to that. The date of that agreement is September 23, 1947, after this suit was filed; in fact, after the trial was commenced. It is a cross-license in which Lane Wells not only licenses under the two patents in suit, but two additional patents on well packers, and coming back to them is a license under a core tester patent from McCullough as a licensee. This also apparently discloses that McCullough had been using the combined gun unmolested for many years, and it is a

compromise of that for a relatively small amount of money. I don't see that it is of any probative value because of its date in this litigation, and I object to it on the ground of its being immaterial and self-serving. [1278]

The Court: How is it relevant to any issue here?

Mr. Foster: It is relevant to this extent, your Honor: It proves a recognition of the validity of the patent in suit by a competitor of the plaintiff and of the defendant.

I am glad that Mr. Mellin mentioned that two of the patents are included. They are included, your Honor, but the court will note that in the second part of section No. 1, which appears upon page 2, it provides that "McCullough shall not have the right to, and agrees that it will not, use, or knowingly sell for use, packers covered by the Renouf or Wells Licensed Patent except in combination with the devices covered by the Spencer and Lane Licensed Patents."

Only four patents were involved.

The Court: Suppose that everyone in the business—

Mr. Foster: I beg your pardon?

The Court: Suppose that everyone in the business but Johnston said, "Yes; those are good patents. We want a license on them." Would that be material here?

Mr. Foster: Yes; I think that would be quite material, your Honor.

The Court: You mean a lay opinion of validity?

Mr. Foster: Yes, your Honor.

The Court: To what issue does it go?

Mr. Foster: It goes to the validity of the issue of the patent; it goes to the technical defense laid by [1279] plaintiff here of paper patent that has been strongly urged by the plaintiff.

There are a host of decisions, your Honor, to establish the doctrine that the commercial success of the device, subject of the patent, is indicative of the validity of the patent.

The Court: There is no question about that, but is this relevant to the issue of whether or not it has been a commercial success?

Mr. Foster: Yes.

The Court: The fact that someone took a paper license on the subject of the litigation?

Mr. Foster: I think so, your Honor, because it is a recognition of validity, just as the commercial success of the sales or uses by the plaintiff would be evidence of public acquiescence and commercial success. In other words, our competitor, a hard-headed business man in this competitive field, would not take a license under an invalid patent.

The Court: Well, he might, if the defendant went to him and said, "Now, we are in litigation down here in Los Angeles with Johnston and we will give you a very good bargain on the license, if you would like it now, because we may win that suit, and if we win that case, why, the license will go up considerably. But if you take it now so [1280] that we can use the license to show commercial success, it is a bargain." Isn't there danger of that?

Mr. Foster: There might be danger but, to my mind, your Honor, that would go to the weight of this evidence, not to its admissibility.

And furthermore, this is not a license for a nominal sum. The provision is made on page 4, in section IV that the royalty shall be \$15.00 for each run if the test is made at a depth of less than 6,000 feet, and \$1.00 additional for each 1,000 feet or fraction thereof deeper

than 6,000 feet. Now, that is not an insignificant amount, your Honor, when we have the number of runs of the combined tool which Mr. Johnston here has testified to. That represents a very substantial sum.

The Court: The purpose of your offer is to show commercial success?

Mr. Foster: Commercial success.

The Court: Of the patent in suit?

Mr. Foster: I beg pardon? Yes, your Honor.

The Court: Of the patent in suit.

Mr. Foster: And a recognition of validity by others.

The Court: That second point disturbs me. Is it relevant to the issue of validity to show that people in business think it is valid?

Mr. Foster: I think so, your Honor. [1281]

The Court: Then, let us test that for a moment. would it be competent to bring in competitors and put them on the stand to say, "Mr. Jones, you are in this business? Yes. You are a competitor of the patentee? Yes. Have you looked at this patent? Yes. In your opinion is it valid or invalid?" Would he be permitted to express that?

Mr. Foster: I think not, your Honor.

The Court: Isn't that what this is?

Mr. Foster: I think it goes a bit—

The Court: In fact, it is a little weaker, isn't it? It is McCullough Tool Company, by implication, saying—not directly, but by implication—saying we believe these patents named in this license are valid.

Mr. Foster: I am sorry, I can't agree with your Honor that the cases are analogous or that this is weaker. I believe this: That a direct obligation to pay is the best possible tribute to the validity of the patent. This substantial royalty makes the cases non-analogous.

I feel, in the case of a competitor coming in and saying, "I think the patents are invalid, "is one that is much. much weaker, because it is shaded by a self-interest.

The Court: You are talking about evidence of commercial success now, or opinion as to validity?

Mr. Foster: Both. This is more than a license, your Honor; it is a tribute of a firm obtaining the obligation [1282] to pay royalty.

The Court: Yes, commercial success.

Mr. Foster: Commercial success and recognition of validity. He would not pay the royalty under invalid patents.

The Court: Do you have any precedent to the effect that licenses under a patent are evidence of validity of that patent?

Mr. Foster: I have no decisions immediately available here, our Honor. We can get them, I am sure, if your Honor desires to reserve a ruling to give me an opportunity to submit some.

The Court: Validity is not a question of fact, is it? It is a question of law?

Mr. Foster: No. But—

The Court: You do not prove a question of law by evidence, do you?

Mr. Foster: But we prove factors such as the commercial success and recognition of validity by competitors, from which the conclusion of law can be drawn.

The Court: I had laid aside for the moment commercial success.

Mr. Foster: Yes.

The Court: And now referring only to the question of validity. [1283]

Mr. Foster: Yes, your Honor.

The Court: May evidence be received on the issue of validity?

Mr. Foster: I think evidence may be received which the court will consider in reaching the legal conclusion of validity.

The Court: Yes; such as commercial success.

Mr. Foster: Yes; and such as recognition of validity by the payment of financial tribute to the patent.

Furthermore, there is another application of this evidence, I think, and that is as to the scope of the patent. In other words, if the patent has been recognized as valid by the industry, by the tribute of royalty to it, that may be considered in your Honor's consideration of the scope to be given the patent.

The Court: But doesn't that all add up to commercial success?

Mr. Foster: Perhaps it does, your Honor.

The Court: I suppose that courts are influenced on the issue of whether or not the patent embodies an invention. Courts are influenced by the opinions of peoples who are skilled in the art; but even if you say that is so pragmatically, isn't the issue still one of law?

Mr. Foster: Yes; I am sure it is, your Honor .

I will offer this as going to the issue of commercial [1284] success of the devices of the patents in suit.

Mr. Mellin: May I be heard on that point for just a moment, your Honor?

The Court: Yes.

Mr. Mellin: There is no foundation here that McCullough made anything under the patent. I have some authorities that are recognized on the point of commercial success, and I want to make certain that this court is not misled.

The Court: Would not that go to the weight of it, as Mr. Foster has just suggested?

Mr. Mellin: Your Honor, I think it would go to the admissibility.

Haggerty v. Rawlings, 14 F. (2d) 928, a decision by the Circuit Court of Appeals for the Eighth Circuit, the court said:

"We need only refer to the alleged pronounced commercial success of the Haggerty guard. That success, to be proof of anything must be confined to the exact thing disclosed by the patent."

That is the rule of *Duer v. Corbin Cabinet Lock Co.*, 149 U. S. 216, 13 S. Ct. 850;

Johnston v. Lambert, 234 Fed. 886 (Second Circuit); *Barker v. Atwell*, 13 F. (2d) 363 (Seventh Circuit Court case). [1285]

That has been the rule, your Honor, about the commercial success. You have to go beyond just a mere license. There would have to be a showing that the device built under the license corresponded to the patent. And I think that this bare license is proof of nothing, because there is no obligation to pay anything if nothing is built, and there is no proof of anything being built. And then there is no proof that whatever was built in any manner corresponded to that disclosed in the patent.

The Court: Would not that go to the weight of it, also?

Mr. Mellin: Perhaps, your Honor. But it seems to me, even on the point of commercial success, without first showing that the device, if anything was made under the license, that it corresponded to the patent; otherwise it is proof of nothing.

The Court: Objection overruled. I will receive the agreement as Defendant's Exhibit AK for the purpose of showing commercial success of the patent in suit.

Mr. Mellin: If your Honor please, the license refers to a cross-license patent by McCullough on a gun tester, that is, the tester and a gun, which was issued some years subsequent to these patents in suit.

Now, we have raised the defense that this Lane device, as shown in the patent, and the Spencer device, are in-operative for any practical purposes, both of them. Our [1286] contention here is that the reason that this cross-license was granted (1) was to buy for \$10,000, or to avoid a lawsuit that would perhaps cost \$25,000 or \$30,000.00; and secondly, to obtain a license under a patent which might produce an operative structure so that the patent owners, it being evident that they could not produce an operative structure from their own patents, required taking a license under a much later patent, a 1942 patent, in order to produce any structure that would operate, that is, a structure which would operate as a combined gun and tester.

The Court: It seems to me that that would all go to the weight of it, if it is relevant to the issue. It is relevant to the issue whether or not the patent in suit is a commercial success. How much weight it carries is another matter.

* * * * *

Mr. Foster: There is only one other matter, your Honor. Professor Daugherty called to my attention this morning, if your Honor please, that he had not disclosed to the court that in his test with the core the hole in one [1287] end of the core was not made with the gun, but was drilled with a rotary drill; that as a result, the wall

of that hole is smooth and it is slightly tapered, that is, it is larger at the end of the core than it is at the inner end of the bore by virtue of being made with a rotary drill.

If the court desires to do so, he is here to confirm that statement, but he wanted the disclosure to be fully made in that regard.

The Court: Will it be stipulated?

Mr. Mellin: Yes, sir.

The Court: That Professor Daugherty may be deemed to have so testified?

Mr. Mellin: Yes, your Honor. [1288]

* * * * *

M. O. JOHNSTON,

recalled as a witness by plaintiff in rebuttal, having been previously sworn, was examined and testified as follows:

* * * * *

Direct Examination [1292]

By Mr. Mellin:

* * * * *

Q. And at the time of these negotiations that you had with respect to a license, Mr. Johnston, under Lane-Wells' patents were you aware at that time that the patent, the Lane patent which we have been discussing here and the [1296] Spencer patent which we have been discussing here, might have been interpreted to include add-

(Testimony of M. O. Johnston)

ing a gun to your own tester? The Lane patent and the Spencer patent in suit; do you understand the question?

The Witness: I don't believe I do.

Mr. Mellin: Would you read it to him? If the court please, may the reporter read him that question?

(Question read by the reporter.) [1297]

A. Well, not at that time, no.

Q. You were aware of the patents, or did you recall them?

A. I was aware of the patents, but I didn't pay any attention to them.

Mr. Mellin: That is all.

Cross Examination

By Mr. Foster:

Q. In those negotiations, Mr. Johnston, you never asked or sought for a license to operate the gun perforators alone; you were seeking only a license to operate the combined tool, that is, a gun perforator combined with a formation tester; that is true, isn't it?

A. That is true, yes, sir. [1298]

* * * * *

NORRIS JOHNSTON,

called as a witness by and on behalf of the plaintiffs,
having been first duly sworn, was examined and testified
as follows:

Direct Examination

The Clerk: Will you state your name, please?

The Witness: Norris Johnston.

The Clerk: Be seated, please.

By Mr. Mellin:

Q. Would you give your full name and your residence?

A. Norris Johnston, 423-1/2 North Painter Avenue,
in Whittier.

Q. And what is your age? A. Forty-five.

Q. Are you any relation to the M. O. Johnston who
is [1327] here in the court room?

A. Not to my knowledge.

Q. What is your occupation?

A. I am a physicist, and at the present time general
manager of Petroleum Engineering Associates, which is
a consulting engineering firm handling problems connected
with the production of oil.

Q. What has been your formal education?

A. I attended the University of Minnesota for two
years, from 1919 to 1921, taking physics, mathematics,
chemistry, and other scientific courses; then three years
more at the Massachusetts Institute of Technology in
Cambridge, studying electrochemistry, chemistry, chemical
engineering, electrical engineering, and physics, mainly.
That finished my work for a Bachelor's degree in electro-
chemistry in 1924. Then I spent one further year to
obtain a Master's degree at the Massachusetts Institute

(Testimony of Norris Johnston)

in 1925, in physics. Subsequent to spending one year as a research engineer with the Carborundum Company in 1925, I attended the California institute of Technology in Pasadena for two and a half years, starting in September, 1926 and finishing in February, 1929, to obtain a Doctor's degree in physics.

Q. What has been, and the extent of it, your practical experience in connection with oil production or oil-producing formations? [1328]

A. Immediately on leaving the California Institute, I was hired by the Union Oil Company of California at Wilmington, for the purpose of designing, constructing, testing and helping with the use of sub-surface instruments. The main job there was a survey instrument to record and indicate at the surface immediately on operation conditions in the well. We also worked with other devices for determining liquid levels, and so on.

Q. I also understand you were employed by the Union Oil Company. When, and over what period?

A. That was with the Union Oil Company.

Q. I beg your pardon. I mean the General Petroleum Corporation.

A. Yes. Subsequent to working with the Union Oil Company, I left them in May, 1931 and spent six and one-half years in charge of the physics research of the Firestone Tire & Rubber Company in Akron, Ohio. Subsequent to that I have spent ten years with the General Petroleum Corporation, where I was in the production engineering department, in charge of production research and core analysis, and had, you might say, consulting work on a lot of the physical problems connected with both drilling and production.

(Testimony of Norris Johnston)

Q. In that work did you make any tests or supervise any tests with respect to the permeability and porosity of sub-surface strata? [1329]

A. Yes.

Q. And, in particular, shale? A. Yes.

Q. Now, just briefly, will you tell us what shale is?

A. Shale is the end result of a sediment of rather fine particle siliceous material, which subsequent to sedimentation is overlain by other sediments and is compressed into a hard, solid rock body. It has physical properties of a solid rock. Sometimes a shale will be hydratable, but it is still hard and impermeable prior to hydration.

Q. By "impermeable" you mean to water?

A. Impermeable to any fluid.

Q. Now, it is my understanding that overlaying an oil reservoir in the earth is either a strata of impermeable shale or shell; is that correct?

A. Yes, normally. I would say practically always a commercial accumulation of oil or gas, hydrocarbons of any sort, is overlain by such an impermeable stratum, because if there were vertical permeability above a given point the accumulation would not remain there, but somewhere higher up in the structure.

Q. In other words, that cap rock, as it is sometimes called, acts as a cover to the oil pool, and if it were not impermeable, the oil would pass up through the shale to a higher level, due to the difference in weight? [1330]

A. Yes. The commercial accumulation of oil is a matter of gravitational segregation. The oil may be formed at any one of several levels, but it migrates under the force, due to the difference in specific gravity between

(Testimony of Norris Johnston)

the saline waters which occur throughout the crust of the earth and the oil and gas itself.

Q. Did you say you made some tests concerning the permeability of shale? A. Yes.

Q. And I am speaking of unfractured shale.

A. Yes, sir.

Q. Such as would cover a commercial oil pool?

A. Yes, sir.

Q. What did you find with respect to the permeability or the ability of water to penetrate or invade into shale, let us say, under a pressure of hydrostatic head of 5,000 feet or 10,000 feet, that is, approximately 5,000 pounds per square inch, and with an ordinary drilling mud in contact therewith, under that pressure what would you say the permeability of that shale would be?

A. Permeability is a measure of a physical property of rock, and insofar as the rock is not deformed by the pressure applied to it, it is an invariant with the pressure. However, regardless of the exact conditions which you have mentioned, the permeability of all the shales I have ever tested has been [1331] a small fraction of one millidarcy. Would the court wish a definition of a millidarcy?

Q. I don't think we will need it, Doctor. Now, assuming that you have such a shale body, with a drilling fluid under the hydrostatic head in contact with it, say, after a period of 24 hours, would the amount of water which would penetrate that shale be measurable or immeasurable?

A. With highly precise laboratory apparatus it might be measurable. In an oil well it would be immeasurable.

Q. If you had a shale body of the type you have spoken of, which would form the cover for a commercial oil pool, and you shot four bullets into it to the extent of

(Testimony of Norris Johnston)

several feet, then subjected those holes to the pressure of mud fluid, put the mud fluid in contact with it, and maintained a pressure of 5,000 pounds per square inch on it for, let us say, 24 hours, will you tell me then whether or not the amount of water which would invade that shale during that period would be a measurable amount or not?

A. If the shale were sufficiently competent to form a cap rock over an oil reservoir, the amount of water entering through four bullet holes, even though several feet deep, in an oil well would not be measurable, no.

Q. Now, Dr. Johnston, isn't that the point—that shale body or shell body, by the way, would there be any difference in your answer if I had said hard shell forming a [1332] cover over a commercial oil pool?

A. No, sir, hard shell is also impermeable.

Q. Now, isn't it at that point which they cement off the casing in ordinary practice, to prevent the migration of waters up and down the casing from below this body of shale to above, to the sands above that thickness of shale?

Mr. Foster: That is objected to. The testimony of the witness is not such as to show that the witness is qualified to answer that question. He has testified to no field experience. Apparently his experience is limited to laboratory experience.

Q. By Mr. Mellin: You are familiar with that problem, are you? A. Yes, sir.

The Court: Do you urge your objection?

Mr. Foster: That is right, your Honor.

The Court: Yes. Lay a further foundation.

(Testimony of Norris Johnston)

Q. By Mr. Mellin: Dr. Johnston, are you familiar with the practice of cementing oil wells?

A. I have not been in charge of such operations, but I am pretty familiar with them, yes.

Q. As a matter of fact, in your engineering experience, petroleum engineering experience, you know the usual practices and are aware of the usual practices concerning points of cementing off well casing to prevent the migration of waters? [1333]

A. Yes, sir.

Q. And the direction, to some extent of the drilling of the well, and the problem of producing from a well are some of the problems with which you have been concerned?

A. Yes, sir.

The Court: Is there objection?

Mr. Foster: Not to that question, but I have objection to a repetition of the question I previously objected to.

Q. My Mr. Mellin: Now, Dr. Johnston, isn't it a common practice, if you know, and assumed to be correct practice by petroleum engineers, to cement the casing in that body of shale which overlies the commercial pool? [1334]

Mr. Foster: I have the same objection, your Honor, that so far as appears from the testimony of the witness, what he knows about the problems and the practice in the field is brought to him by the operators or laboratories and he is consulted as physicist.

The Court: The question, as I understand it, is not what is done, but what a prudent operator should do; is that it?

Mr. Mellin: That is right.

(Testimony of Norris Johnston)

Mr. Foster: He is not a petroleum engineer. He is not qualified by practice, nor, so far as his testimony goes, by operations, as to what a prudent petroleum operator would do. He is not a petroleum engineer; he is a physicist.

The Court: Is there any way of knowing what is a petroleum engineer?

Mr. Foster: I think so.

Mr. Mellin: What about Dr. Petty?

The Court: Are there degrees of petroleum engineers?

Mr. Foster: No, your Honor. But I think those who have for years supervised the handling of wells and production of oil, rather than a physicist, are the ones who are qualified to answer this question.

The Court: That might go to the weight of his opinion. Objection overruled. You may answer. [1335]

Mr. Mellin: Do you have the question in mind, Doctor?

A. I believe so. It is the common practice to use the cap rock to roof over an oil reservoir or gas reservoir, along with the pipe structure to the surface, if the two are fastened together securely, as a means for keeping the oil and gas under control so it may be produced commercially through the well bore. So that, ordinarily, the casing which is used to exclude other fluids not wanted is cemented into the competent shale or shell immediately overlying the oil reservoir by the process of cementing with a slurry of cement.

Q. Doctor Johnston, in your work you advise operators to the point of whether or not a certain formation is the proper formation within which to cement the pipe?

A. I have so advised; yes, sir.

(Testimony of Norris Johnston)

Q. Would you advise a prudent operator to shoot for water shutoff test in any shale or shell formation which was not impermeable?

A. No; I would not so advise.

Q. That is all—just one moment. There is such a thing as fractured shale, isn't there, Doctor?

A. Yes.

Q. If the fractures in the shale extend completely through the thickness of the shale so that there is a passage from the upper side of it, was in an oil sand, [1336] to the lower side of it, was in an oil sand, would a prudent operator set his pipe and cement in that shale to effect a water shutoff, or could there be such a shale?

A. Yes; such a shale could exist, but it would not normally form the cap rock over an oil reservoir, because if there were permeability through the shale, the reservoir would not exist at that point, but at some higher or shallower level. Consequently—

Q. I see. So, then, as a matter of fact, Doctor, the shale ordinarily overlying oil-bearing sand having commercial possibilities, I mean commercial quantity of oil in the reservoir, that you could say for all practical purposes that that sand is impermeable, or that shale is impermeable?

A. Yes; it would not be fractured so extensively as to be considered anything but impermeable.

Q. If it is fractured partly but it does not extend to the boundaries, and you cement the casing in that shell,

(Testimony of Norris Johnston)

what happens to the crevices or the cracks at a cementing operation?

A. Well, they would be filled with the cement slurry if they were large enough to take any appreciable amount of fluid, or with the filtrate from the cement slurry if they were not large enough to take the particles of cement themselves. [1337]

Q. And therefore, would they offer any reservoir for water from the mud cake or from the mud fluid which might be put in contact with that formation under pressure?

A. No; they would not.

Mr. Mellin: That is all.

Cross Examination

By Mr. Foster:

Q. Dr. Johnston, if after cementing off in this shale body a perforation is made and a sample is taken and water is secured, where does the water come from?

A. Do you mean a considerable amount of water?

Q. Yes.

A. I would come to the conclusion that the cement job was not satisfactory and that the cement had probably channeled around the pipe, rather than forming a complete ring cementing the pipe firmly into the shale. That is the purpose of the water shutoff test.

Q. The water would be coming not from the shale, but from the sand body above or below it, is that true?

A. That is correct.

(Testimony of Norris Johnston)

Q. And it is possible the water may have come through any cracks that were in the shale?

A. That is correct, providing such fractures were of considerable extent and reached to a point where a [1338] permeable zone contained water.

Q. Is it possible that the gun perforating, that is, the impact of the travel of the projectile and the shock wave might make cracks and crevices in the shale body, communicating with the sand body having water in it?

A. That is possible, but I would say that a prudent operator would not shoot into a shale body that was so thin that that could take place. If the shale body was not completely competent and impermeable and capable in itself of enclosing an oil reservoir, were a matter of inches or a foot or two in thickness, I would say that most prudent operators would not try to shoot into that but would set their pipe, cement the pipe, and drill through and test the oil formation below to see whether the cement job had been satisfactory, rather than trying to shoot into the shale itself to see whether the job had been satisfactory.

Q. From your experience in the many tests you have made with shales to determine their principal properties, it indicates clearly to you, does it, Doctor, that a shock or disturbance such as that of the travel of the gun perforator and the explosion of a gun perforator bullet in the explosion of the powder charge could very well cause cracks and crevices in a shale body adjacent the path of travel of the projectile? [1339]

A. Shale is a compactable material in the early stages of its life, and it never loses completely its slight degree of resilience; it does eventually become a fairly hard rock,

(Testimony of Norris Johnston)

but it is composed of very fine particles and is slightly resilient, in differentiation from a sandstone or very hard sandstone known as shell which is definitely a brittle, crystalline material. Consequently, I would say that fracturing in a shale could exist, but would probably not be very extensive.

Q. It would be more likely to exist and more extensive in a sand formation?

A. Not in the sand formations, particularly the softer ones, but a hard cemented sand formation into which one would shoot for a water shutoff test, I would think the fractures might exist further in the sandstone.

Q. You have made tests of cores in the productive formation zones, haven't you?

A. Core analysis tests?

Q. Yes. A. Yes.

Q. And from your intimate knowledge of these cores, isn't it your opinion that when a gun perforator fires a projectile that cracks and crevices can be developed adjacent to the path of the travel of the projectile?

A. I have not made laboratory tests on the material [1340] immediately surrounding a gun perforator hole. I doubt if anyone else has.

Q. But, from your knowledge, I say, of the physical properties of such cores on productive formations, oil productive formations, you would conclude the fact that such cracks and crevices would occur?

A. Yes; such fractures should exist, from the knowledge of the physical properties and of the forces present. But I would say that, in general, they would be separations of the material without—that is, they would be a

(Testimony of Norris Johnston)

disconnection of adjacent parts of the material, without on open hole or fissure appearing.

Q. What, in your opinion, with respect to any of the oil production cores which you have worked with, is the maximum width to which such cracks or fissures could be developed with a gun perforator?

A. You are speaking of the width of the separation of the two sides of the fracture?

Q. Yes. A. Not the length of travel?

Q. That is true.

A. Considering that the material is under an overburden pressure in the well, I would repeat, as I said before, that a fracture which did occur would be of microscopic width, that is, a mere disconnection of the [1341] material, without an opening appearing, as in glass you can have a crack some distance in glass without any space appearing in the glass. It is merely a disconnection of the material.

Q. What, in your opinion, from your experience, is the maximum length of such cracks?

A. Well, that is getting very conjectural, Mr. Foster. I don't know. I would say very few inches.

Q. From your knowledge of such cores in oil productive formations would you say that the firing of a projectile from a gun perforator into them would cause such a disturbance as to facilitate, make greater, the flow of fluids from the formation into the casing?

A. Greater than what, Mr. Foster?

Q. Greater than would be the case if we merely cut through the casing and the cement and the mud cake

(Testimony of Norris Johnston)

adjacent thereto and took the formation fluids from the walls of the hole?

A. There is a greater area of exposure, a drainage area, you might say, which could increase the take of fluid from the formation into the well.

The Court: You mean when there is perforation by gun fire?

The Witness: Yes. The further that bullet penetrates, the more fractures which are caused by that shock. [1342]

Q. By Mr. Foster: You are the Mr. Norris Johnston who wrote an article entitled "Core-Analysis Interpretation," are you not? A. Yes, sir.

Q. I note that on page 1 of that article, in the middle of the paragraph under "Porosity," you state with respect to pores: "Some of them are not connected at all, but are sealed off hermetically, and represent 'isolated porosity.'" Would you not expect the gun perforation into a productive formation to link up some of the sealed-off pores, and hence increase the productivity by virtue of the perforation?

A. Sealed-off pores would be connected to the extent, after perforation by the gun bullet or bullet, by the fracture, if any, surrounding such bullet hole. But the amount of fluid available in a sealed pore is all that that pore can contribute to the flow into the well and therefore is not of great consequence. A pore is of consequence in allowing production into the well only insofar as, besides adding its microscopic quantity of oil, acts as a part of a long channel into the well from below other pores.

(Testimony of Norris Johnston)

Q. In general, in this paper you point out, do you not, that the formation of a mud cake in the taking of a core obscures the results or masks them to some extent, that is, obscures or masks a determination of the [1343] productivity of that zone?

A. There has been a great deal of controversy among the petroleum engineers as to how much the productivity of—a zone in production, you are saying now, that is, in the production of the oil well, not during a formation test. I have had no direct engineering experience with the testing of samples of sand immediately adjacent to a formation test. I have been in connection with tests of the productivity of oil wells for several years. And there has been a great deal of controversy as to how much the productivity of a well is diminished by the presence of the mud cake; but there is general acceptance of the fact that the mud cake itself to some extent decreases the permeability of the—correction, please—decreases the productivity of the zone into which either gun perforations or some other type of opening into the well are produced.

Q. And is it also generally accepted that the impediment to the flow of the formation fluids into the well afforded by the presence of fresh water likewise decreases the productivity of the well?

A. Yes; that is accepted.

Q. And both those factors are generally accepted, and accepted by you, as some of the explanations why it is impossible to correctly correlate the laboratory determination of the permeability of the formation with the

(Testimony of Norris Johnston)

productivity [1344] of the formation, measured in barrels per day per pound drop per foot of sand?

A. That is correct. It is very seldom that an oil well produces its full theoretical amount or rate of production of oil based on core analysis alone.

Q. And a third such factor affecting the same thing is a mud intrusion into the sands?

A. To some slight and unknown extent that is also true.

Q. And another like factor with the same effect is the swelling of clay particles by contact with fresh water?

A. That is true. [1345]

* * * * *

Mr. Foster: One moment. A point was raised this morning that there was no evidence as to the payment of any amounts pursuant to the license agreement between Lane-Wells and McCullough Tool.

The Court: Are you referring to Defendant's Exhibit AK?

Mr. Foster: To Defendant's Exhibit AK, yes, your Honor. I have a witness in court whom I will produce, unless Mr. Mellin is willing to accept this stipulation: That the witness is Mr. Ingle from the comptroller's office of the Lane-Wells Company, defendant here; and in [1425] the regular performance of his duties he receives remittances such as remittances from the McCullough Tool Company; that he did receive, shortly after the date which it bears, a royalty statement; it was received on November 26, 1947, a royalty statement dated November 24, 1947, from McCullough Tool Com-

pany, and accompanying it a check which was No. 10776 from the McCullough Tool Company for \$650, the amount of royalties shown by the statement to be due for the month of October, 1947.

And I show to counsel the original of the letter from McCullough Tool, or report, and the voucher stub which accompanied the check.

If Mr. Mellin is willing to stipulate that Mr. Ingle, for all purposes of this trial, may be deemed to have so agreed and testified, I believe that is all.

Mr. Mellin: I will stipulate that he would so testify, your Honor, but I do not waive objection as to materiality.

The Court: Very well. That is offered for the purpose of proving commercial success, I take it?

Mr. Foster: Yes, your Honor. May the stipulation be accepted by the court, your Honor?

The Court: The objection heretofore made to the admission of Defendant's Exhibit AK will be deemed to have been made to the admission of this evidence to which you [1426] have stipulated.

Mr. Mellin: Yes, your Honor.

The Court: With respect to the payment by McCullough Tool Company, and the witness will be deemed, pursuant to the stipulation, to have so testified.

Mr. Foster: Thank you, your Honor. And may I offer into evidence as Defendant's Exhibit AM-1 the report dated November 24, 1947; and as Defendant's Exhibit AM-2, the voucher stub No. 10776 which accompanied the check, and ask leave of the court, and through the court, permission of Mr. Mellin, to substitute photo-

stats of these after they have been marked by the clerk. These are our only copies.

Mr. Mellin: I have no objection to copies if it is admissible at all.

The Court: The McCullough Tool Company royalty report, is that what it is?

Mr. Foster: Yes, your Honor.

The Court: And the voucher stub.

Mr. Foster: No. 10776.

The Court: You make the same objection?

Mr. Mellin: Yes, your Honor, as I did to the license agreement.

The Court: To Defendant's Exhibit AK. That objection likewise will be overruled and the documents received into evidence as Defendant's Exhibits AM-1 and 2. [1427]

Mr. Mellin: If your Honor please, through the court, may I ask Mr. Foster if he will stipulate that if that same witness were asked, he will testify that this is the first royalty payment they ever received on the license agreement?

The Court: I take it that it will be stipulated?

Mr. Foster: Is that right? Pardon me, your Honor. That is so.

The Court: It is stipulated, then, as I understand it, that this payment from McCullough Tool Company in November of this year is the first royalty.

Mr. Mellin: Ever received on the patents, either of the patents in suit.

The Court: Is that the stipulation?

Mr. Foster: Yes; that is the stipulation.

The Court: Either the Lane or the Spencer patent.

Mr. Foster: Yes; I will so stipulate, your Honor. [1428]

* * * * *

Mr. Foster: There is only one other thing, your Honor. The court indicated that perhaps by the end of the trial we would be able to stipulate as to the validity of the Leur (?) patent under which the plaintiff is licensed and the O'Neill patent, licensed by Mr. Johnston, pertaining to the two claims that I read here. I have had no indication from Mr. Mellin: Is he prepared? [1433]

* * * * *

The Court: The arguments have been most helpful to me. I want to commend counsel on both sides on their manner of presentation. The expert witnesses' opinions have been most interesting and equally helpful.

I find that the Lane patent describes a combination that is new and useful.

I am most doubtful whether the claimed invention involves more than a mere aggregation of old elements which produce a result not different in kind from that produced by using the tools separately.

I am also doubtful whether, in effecting the combination of the perforator and tester, more than the

ingenuity involved in the work of a mechanic skilled in the [1615] art is called into play.

The Patent Office has found invention in the Lane patent. The presumption is in favor of validity, and precedent directs me, in a doubtful case, to resolve the doubt in favor of validity.

So I find that the combination claimed by Lane embodies invention.

We pass from that to precisely what are the limits of the invention claimed. Congress requires the applicant for the monopoly of a patent to make a distinct and specific statement of what he claims to be new and to be his invention.

It was that want of definiteness and specificity in the Halliburton case that led to the Walker patent there being declared invalid, of course.

It is a close case, in my mind, whether this Lane patent should not be declared invalid upon the same grounds. There, again, I will resolve the doubt in favor of validity and hold that the patent is valid.

Then we come to the question of infringement. It is my opinion, in view of the fact that the claims made are very indefinite and very broad, and the fact that no device disclosed in the patent has ever been put to use, that the claims should be limited in their breadth to the precise device shown in the Lane patent. I therefore find that the [1616] Johnston device does not infringe any of the claims of the Lane patent.

With respect to the Spencer patent, it is my view, assuming validity of Lane, that Spencer's contribution was nothing more than a normal development of an old art; and that what he did rises to no greater dignity than the bringing together of a mere aggregation of old elements.

It seems to me, also, that no more ingenuity was involved there than the work of a mechanic skilled in the art, and I so find.

Accordingly, findings and judgment are ordered in favor of the plaintiff, and counsel for the plaintiff will prepare and submit proposed findings of fact, conclusions of law, and decree pursuant to the Rule, within 10 days.

[Endorsed]: Filed May 18, 1948. Edmund L. Smith, Clerk. [1617]

[Endorsed]: No. 11965. United States Court of Appeals for the Ninth Circuit. Lane-Wells Company, a corporation, Appellant, vs. M. O. Johnston Oil Field Service Corporation, Appellee. M. O. Johnston Oil Field Service Corporation, Appellant, vs. Lane-Wells Company, a corporation, Appellee. Transcript of Record. Appeals From the District Court of the United States for the Southern District of California, Central Division.

Filed July 2, 1948.

PAUL P. O'BRIEN

Clerk of the United States Court of Appeals for the
Ninth Circuit

In the United States Circuit Court of Appeals
for the Ninth Circuit
No. 11965

LANE-WELLS COMPANY, a corporation,
Appellant and Cross-Appellee,
v.

M. O. JOHNSTON OIL FIELD SERVICE CORPO-
RATION, a corporation,
Appellee and Cross-Appellant.

M. O. JOHNSTON OIL FIELD SERVICE CORPO-
RATION, a corporation,
Appellee and Cross-Appellant,
v.

LANE-WELLS COMPANY, a corporation,
Appellant and Cross-Appellee.

CONCISE STATEMENT OF POINTS ON WHICH
APPELLEE AND CROSS-APPELLANT IN-
TENDS TO RELY

Now comes M. O. Johnston Oil Field Service Corpo-
ration, a corporation, Appellee and Cross-Appellant here-
in, and adopts the Concise Statement of the Points on
Which Plaintiff-Appellant Intends to Rely on Appeal,
filed in the District Court and already appearing as a
part of the record on appeal herein, as the Concise State-
ment of Points on which it intends to rely on this appeal.

HILL, MORGAN & FARRER
WILLIAM M. FARRER
MELLIN AND HANSCOM
OSCAR A. MELLIN

Attorneys for Appellee and Cross-Appellant
[Proof of Service.]

[Endorsed]: Filed Jul. 15, 1948. Paul P. O'Brien,
Clerk.

[Title of Circuit Court of Appeals and Cause]

STIPULATION AND ORDER RE: PRINTING OF
DOCUMENTARY EXHIBITS

It is hereby stipulated and agreed by and between the parties to the above entitled cause that the following documentary exhibits need not be printed or reproduced in the record on appeal herein but that reference may be had thereto with the same force and effect as though reproduced herein:

Plaintiff's Exhibits 3, 5, 6, 8, 9, 10, 12-A, 12-B, 12-C, 32, 33, 35, 36-A, 36-B, 37, 38-A and 38-B.

Defendant's Exhibits F-1 to F-8, inclusive, G, K, L, M, O-1, O-2, T, W, Z, AB, AD, AF, AL, Q, R, V-1, V-2, Y-1, Y-2, and 30-B-1 to 30-B-5, inclusive.

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ORDER

The foregoing stipulation is hereby approved and it is so ordered.

Dated: July 20, 1948.

FRANCIS A. GARRECHT

United States Circuit Judge

[Endorsed]: Filed Jul. 20, 1948. Paul P. O'Brien,
Clerk.

[Title of Circuit Court of Appeals and Cause]

NOTICE OF ADOPTION OF STATEMENT OF
POINTS

Appellant hereby adopts as its statement of points under Rule 19(6) on its appeal the concise statement of points on appeal under Rule 75(a) appearing in the transcript of the record certified by the Clerk of the District Court and filed herein.

Dated: At Los Angeles, California, this 19th day of July, 1948.

HARRIS, KIECH, FOSTER & HARRIS
WARD D. FOSTER

By Ward D. Foster
Attorneys for Appellant

Received copy of the within Notice this 20th day of July, 1948. Hill, Morgan & Farrer D, Attorneys for Appellee.

[Endorsed]: Filed Jul. 24, 1948. Paul P. O'Brien,
Clerk.

[Title of Circuit Court of Appeals and Cause]

DESIGNATION OF APPELLANT-CROSS-
APPELLEE

Appellant-Cross-Appellee, Lane-Wells Company, hereby adopts the Designation of Contents of Record on Appeal by Defendant-Appellant, filed in the District Court and already a part of the record on appeal herein, as its designation on appeal of the record to be printed.

Dated: At Los Angeles, California, this 2nd day of August, 1948.

HARRIS, KIECH, FOSTER & HARRIS
WARD D. FOSTER

By Ward D. Foster

Attorneys for Appellant-Cross-Appellee

Received copy of the within Designation this 2nd day of Aug., 1948. Mellin & Hanscom and Hill, Morgan & Farrer, William M. Farrer.

[Endorsed]: Filed Aug. 3, 1948. Paul P. O'Brien, Clerk.